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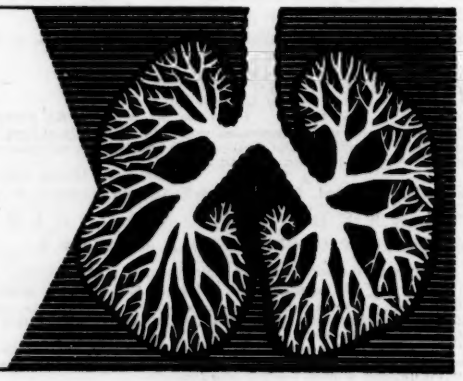

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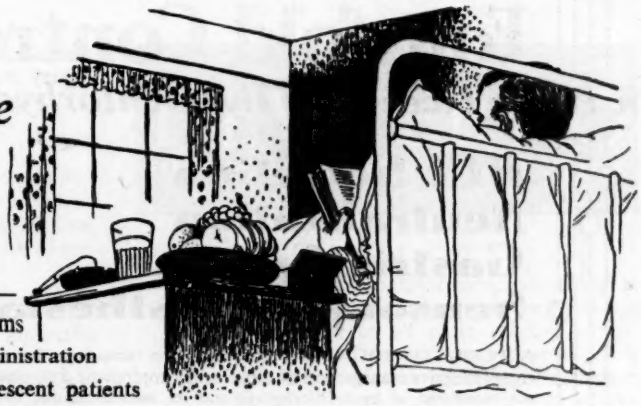

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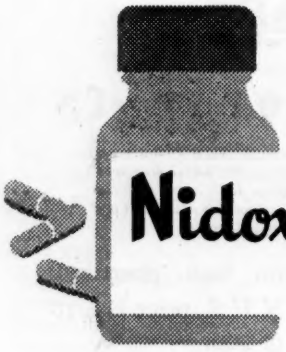

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LITERATURE ON REQUEST

A 1000-year old drug takes on a new significance

FOR a thousand years—and probably longer—the value of senna has been recognised. But not until the introduction of **Senokot** has the *full* therapeutic activity of the drug been made available and its re-educative effect demonstrated.

CLINICAL EVALUATION

"A reliable, completely satisfactory preparation of senna."
Brit. Encycl. Med. Pract., Int. Suppl., March, 1954.

"Constant in action, produces no discomfort, and has no after-constipating effect." *Medical Press, June 9, 1954, p. 523.*

"A valuable ally in the cure of chronic constipation."
Practitioner, March, 1953, p. 272.

Senokot Regd

STANDARDISED SENNA GRANULES

CATEGORY 3: Joint Committee on Prescribing

PACKINGS—2 oz., 6 oz.; and 2 lb. (Tax Free).

WESTMINSTER LABORATORIES LTD., CHALCOT ROAD, LONDON, N.W.1

NOW AN ACCEPTED TREATMENT . . .

Transvasin

Contains skin-penetrating esters of salicylic, nicotinic, and p-aminobenzoic acids. It brings real relief to deep-seated muscular rheumatism by simple inunction.

TRANSVASIN, a new preparation developed by Hamol S.A., our Swiss associates, and now available for prescription in this country, contains *esters* of salicylic, p-aminobenzoic and nicotinic acids. These esters readily pass the skin barrier in therapeutic quantities and enable an effective concentration of the drugs to be built up where they are needed. Transvasin not only induces vasodilation of the skin with a superficial erythema, but also brings about a deep hyperaemia of the underlying tissues. It is non-irritant, and can be safely used on the skin.

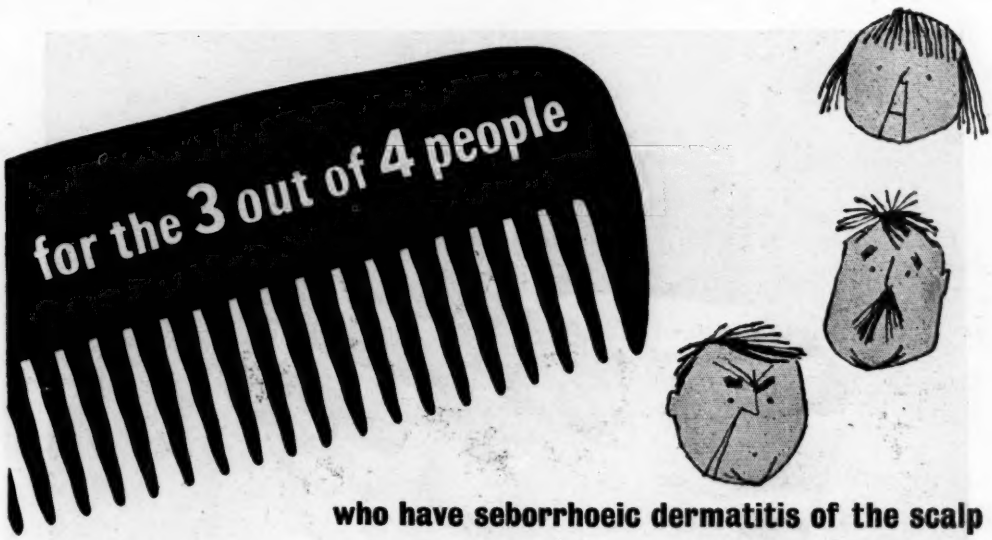
It is now being widely prescribed, with highly successful results. There is evidence, also, that since a very small quantity is sufficient for each application, the cost of treatment is extremely low.

Salicylic acid tetrahydrofurfuryl-ester	14%
Nicotinic acid ethyl-ester	2%
Nicotinic acid n-hexyl-ester	2%
p-Aminobenzoic acid ethyl-ester	2%
Water-miscible cream base ad	100%

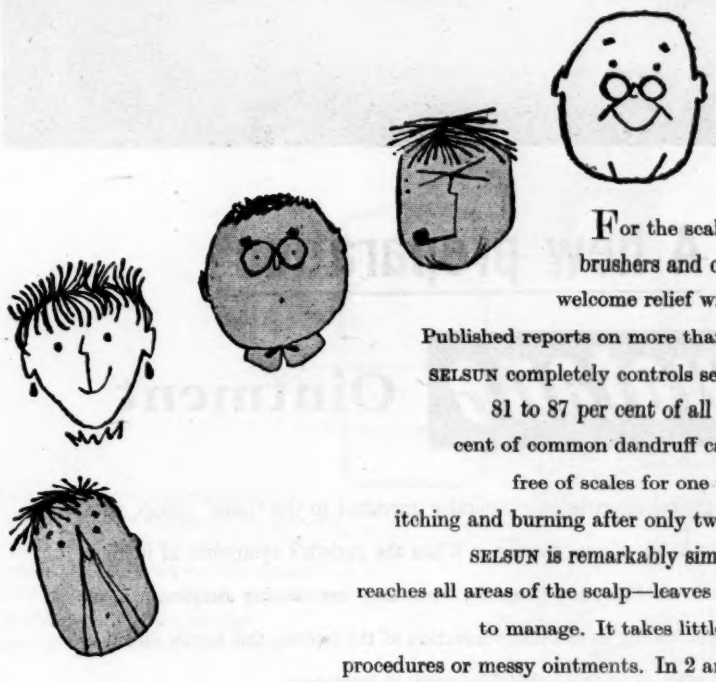
Transvasin is available in 1 oz. tubes at 3/4½ plus 7½d P.T., which are obtainable on form E.C.10, and is not advertised to the public.

Samples and literature will be gladly sent on application.

LLOYD-HAMOL LTD., 11 Waterloo Place, London, S.W.1 WHItehall 8654/5/6



who have seborrhoeic dermatitis of the scalp



For the scalp-scratchers, shoulder-brushers and comb-clutterers, there's welcome relief with SELSUN Suspension. Published reports on more than 400 cases[1-3] show that SELSUN completely controls seborrhoeic dermatitis in 81 to 87 per cent of all cases, and 92 to 95 per cent of common dandruff cases. It keeps the scalp free of scales for one to four weeks—relieves itching and burning after only two or three applications. SELSUN is remarkably simple to apply, it quickly reaches all areas of the scalp—leaves the hair clean and easy to manage. It takes little time. No complicated procedures or messy ointments. In 2 and 4 fluid ounce bottles with full directions on special label.

Abbott

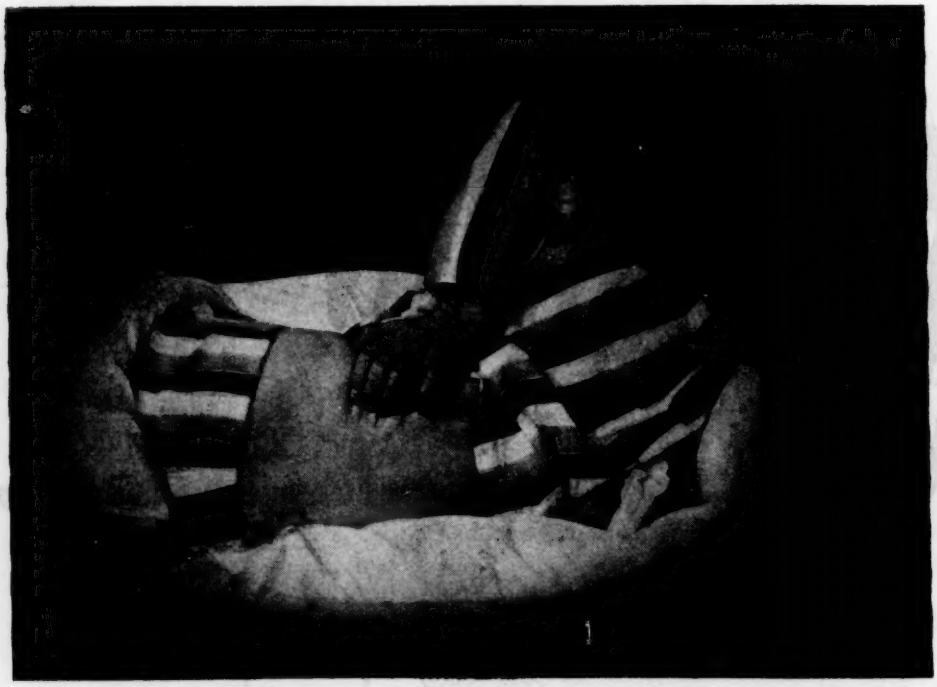
SELSUN Regd.

Suspension

(SELENIUM SULPHIDE, ABBOTT)

1 (1952), *Arch. Dermat. & Syph.*, 65:228, *February.*
2 (1951), *Arch. Dermat. & Syph.*, 64:41, *July.*
3 (1952), *J. Missouri Med. Assn.*, 49:911, *November.*

ABBOTT LABORATORIES LTD PERIVALE GREENFORD MIDDX



A new preparation

Quotane Ointment

Amino-Alkoxyisoquinolines.

Here is a new topical anaesthetic, chemically unrelated to the 'caine' group, with a remarkably low index of sensitization. When the patient's symptoms of itching, burning, and pain are hindering progress, when they are causing sleeplessness, or when scratching is leading to secondary infection of the lesions, this highly effective antipruritic may often provide a valuable support to treatment.

In 1-oz. (28g.) tubes

MENLEY & JAMES, LIMITED, Coldharbour Lane, London, S.E.5

for Smith Kline & French International Co., owner of the trade mark 'Quotane' (British Patent No. 681358) QOP74

In keeping with the times

In Great-grandfather's day the ingredients for preparing therapeutic compounds were kept at the druggist's in characteristic jars which were inspired chiefly by decorative criteria reflecting the taste of the period.

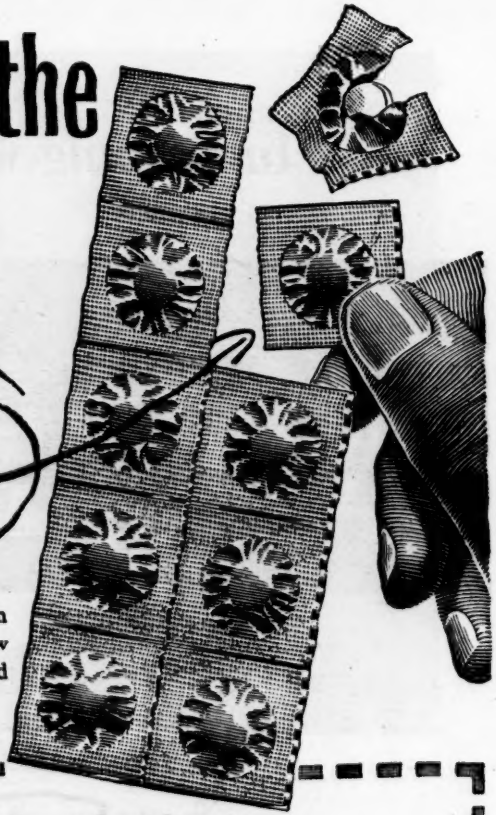
Today a Pharmaceutical Industry in the vanguard is equipped to provide each speciality with a packing appropriately designed on the basis of functional criteria such as to anticipate the qualitative and quantitative requirements of modern therapy.

CARLO ERBA MILANO
ESTABLISHED: 1853

TABILLIN in the new 'Foil-Pac'

This new method of packing protects each tablet until used

individually sealed tablets —detached as required



— a most important consideration in oral penicillin therapy, which is now established as a satisfactory method of *systemic administration.*

Tabillin offers these advantages:

1. Tabillins, being individually sealed, are protected against contamination and loss of potency.
2. Each dose of Tabillin is protected until required—therefore superior to liquid preparations.
3. Any quantity of Tabillin can be prescribed and dispensed without losing the advantages of individually-sealed protection. Wastage is eliminated.
4. Tabillins contain soluble penicillin which gives higher and more persistent blood-levels than do insoluble penicillin salts.
5. 'Foil-Pac' Tabillins are economical. Available at no greater cost than unwrapped tablets.

Whenever Oral Penicillin Therapy is indicated, Tabillin is the preparation of choice.

TABILLIN *Penicillin Tablets B.P.*

Tablets of 100,000, 200,000, 400,000 and 500,000 I.U. Containers of 10 and 100 tablets.

Descriptive Literature obtainable from Medical Dept, Boots Pure Drug Co. Ltd., Nottingham

Boots 1199

Three little maids

from school

are we . . .

• CONTROLLED • SAFE • CONFIDENT

Alert and interested in her lessons—rarely absent—sociable, and keen on games ; these are the marked improvements frequently seen in the epileptic child, following 'Mysoline' therapy.

This entirely new anticonvulsant combines high efficacy with low toxicity and freedom from hypnotic effect. With these valuable characteristics, 'Mysoline' is now internationally recognised as an important advance in the treatment of epilepsy.

'MYSOLINE'

Primidone Trade Mark

(*5-ethyl-5-phenyl-hexahydropyrimidine-4:6-dione*)

a new anticonvulsant

IMPERIAL CHEMICAL (PHARMACEUTICALS) LTD.
A subsidiary company of Imperial Chemical Industries Ltd.
WILMSLOW, MANCHESTER

Ph. 436

"... generally after the first application there follows a feeling of warmth, improvement in the circulation and relaxation."*

* Pro medico 21, 429-431 (1952)

FINALGON OINTMENT

tube of 20 g

COMPOSITION:
Nonylic acid vanillylamide 0.4% and Nicotinic acid-β-butoxyethyl ester 2.5% in a suitable ointment base

produces a pleasant feeling of warmth lasting for hours and relieves rheumatic pains

LEWIS LABORATORIES LTD., LEEDS 9

Considerable increase in muscle blood flow

Dilatal

TRADE MARK

low toxicity

Widely indicated in the treatment of circulatory disorders

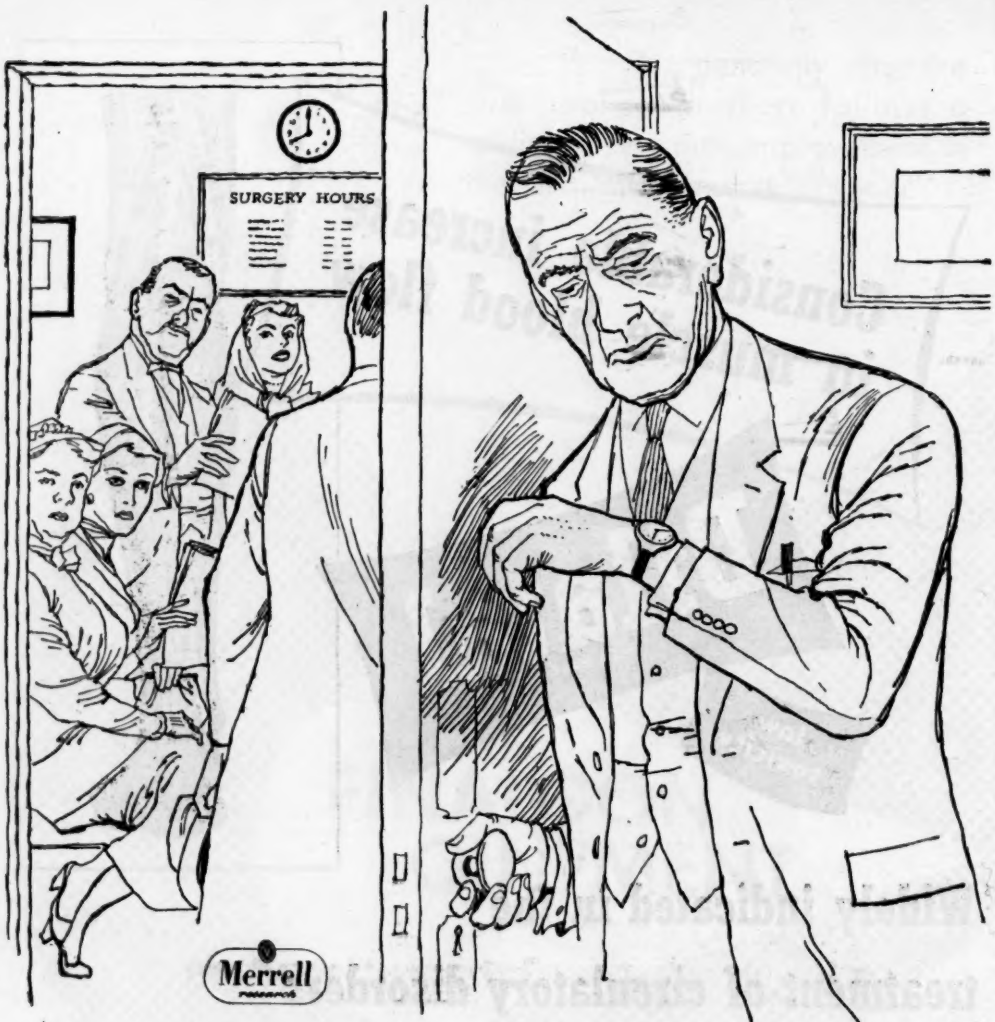
- INCREASED CARDIAC OUTPUT MAINTAINS MEAN ARTERIAL PRESSURE.
- DIRECT ACTION ON THE MUSCULATURE OF THE BLOOD VESSELS.

DILATAL* is safe and rapidly effective by oral and parenteral administration. Available in tablets (2.5 mg. in containers of 100 and 500) and ampoules (5 mg. in 1 ml.—in boxes of 12).

* 1-(p-hydroxyphenyl)-2-(1'-methyl-3'-phenyl-propylamino)-propanol-(1) hydrochloride

SMITH & NEPHEW LTD.,
WELWYN GARDEN CITY, HERTS.,
the marketing organisation of Herts Pharmaceuticals Ltd.,
the manufacturers and owners of the trade mark DILATAL.

GH100



The manifestations of a functionally disordered gastro-intestinal tract, agonising at their worst, are at their least a source of social embarrassment which can be distressing in the extreme. Busy people, who must often go long hours without time for food, have good reason to hail the advent of an effective anti-spasmodic which will, in more senses than one, quieten their yearning bowels.

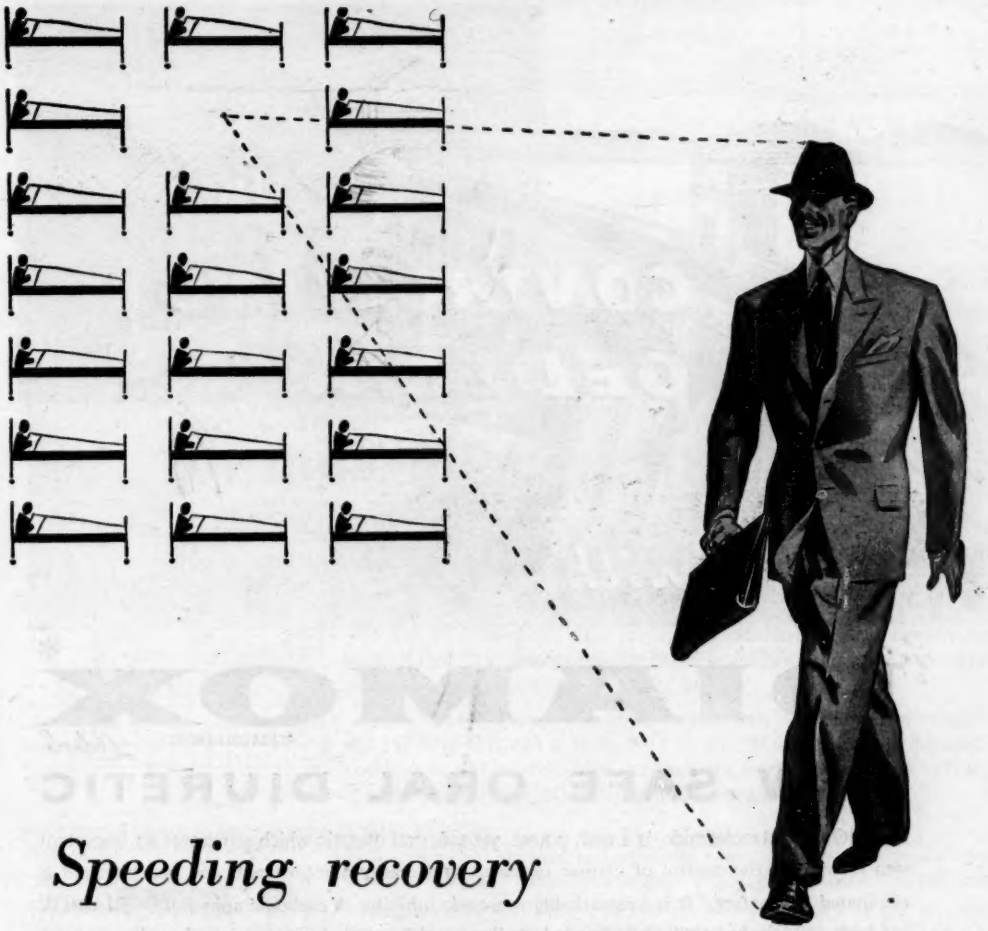
MERBENTYL

distributed in the United Kingdom & Eire by
RIKER LABORATORIES LIMITED, LOUGHBOROUGH, LEICS.
for the Wm. S. Merrell Company, London.

MERBENTYL *Tablets each containing 10 mg. Diethylaminocarbethoxybicyclohexyl hydrochloride.*

MERBENTYL WITH PHENOBARBITONE *Tablets each containing 10 mg. Diethylaminocarbethoxybicyclohexyl hydrochloride and 15 mg. (gr. ¼) Phenobarbitone.*

Each in bottles of 50 and 250 tablets. The basic N.H.S. cost of treatment is less than 5d. a day.



Speeding recovery

Almost every illness leaves behind it the problem of enervation. In Metatone the appetite-promoting properties of Vitamin B_1 are combined with the toning influence of the glycerophosphates upon the nervous system. Pleasant-flavoured Metatone can be given safely during pregnancy and lactation and is also an excellent tonic for children.

FORMULA
Each fluid ounce of Metatone contains:

Vitamin B_1	3 mgm.
Calcium Glycerophosphate	4 gr.
Potassium Glycerophosphate	4 gr.
Sodium Glycerophosphate	2 gr.
Manganese Glycerophosphate	¼ gr.
Strychnine Glycerophosphate	8/200gr.

METATONE

PARKE, DAVIS & Company Limited *Inc. U.S.A*

HOUNSLOW, MIDDLESEX Tel.: HOUnslow 2361

DIAMOX*

ACETAZOLEAMIDE *Lederle*

NEW SAFE ORAL DIURETIC

DIAMOX, Acetazoleamide, is a new, potent, yet safe oral diuretic which represents an important step forward in the control of cardiac oedema. It is easily administered, and oedema fluid is eliminated with safety. It is a remarkably non-toxic inhibitor of carbonic anhydrase. DIAMOX has been intensively tested clinically, and studies have shown that many cases of cardiac oedema previously requiring mercurials have been maintained oedema-free on DIAMOX alone. It allows for steady rather than intermittent control and has the following special advantages in general practice:—

Not a mercurial or xanthine derivative
A single dose induces profuse diuresis for 6—12 hours
It is potent yet remarkably safe
Suitable for regular use at home
Permits undisturbed sleep at night
Neither a gastro-intestinal nor renal irritant

For the long-term treatment of cardiac oedema

DOSAGE 1-1½ tablets orally each morning or every other morning according to the patient's weight.

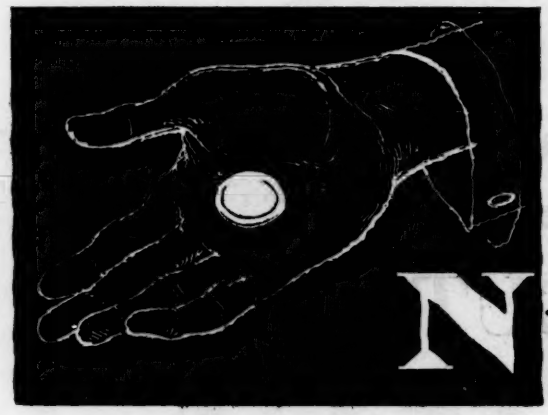
PACKING: Scored tablets of 250 mg. Bottles of 25 and 100.

Literature on request

* *Regd. Trade Mark*

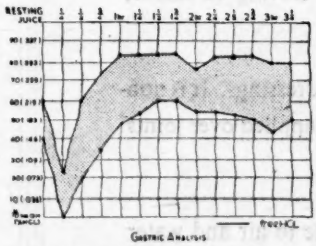
LOOK TO *Lederle* FOR LEADERSHIP

LEDERLE LABORATORIES DIVISION
Cyanamid Products Ltd.
BUSH HOUSE, ALDWYCH, LONDON, W.C.2. TEMPLE BAR 5411

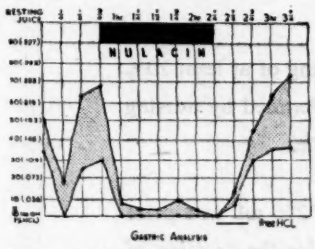


Nulacin

for milk-alkali drip therapy without inconvenience



Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer



Same patients as in Fig. 1, two days later, showing the striking neutralizing effect of sucking Nulacin tablets (3 an hour). Note the return of acidity when Nulacin is discontinued.

The use of milk-alkali drip therapy in establishing and maintaining a state of gastric anacidity has for many years been accepted as a standard practice in the treatment of peptic ulcers.

Such a continuous antacid effect could only be achieved by administering the drip through a tube, with its attendant inconvenience and discomfort to the patient. NULACIN tablets, held in the buccal cavity, give continuous neutralization without inconvenience or discomfort.

INDICATIONS

NULACIN tablets are indicated whenever neutralization of the gastric contents is required: in active and quiescent peptic ulcer, gastritis, gastric hyperacidity.

Beginning half-an-hour after food, a NULACIN tablet should be placed in the mouth and allowed to dissolve slowly. During the stage of ulcer activity, up to three tablets an hour may be required. For follow-up treatment, the suggested dosage is one or two tablets between meals.

NULACIN tablets are not advertised to the public and have no B.P. equivalent. May be prescribed on E.C.10. The dispensing pack of 25 tablets is free of Purchase Tax. (Price to pharmacists is 2/-.) Also available in tubes of 12.

NULACIN tablets are prepared from whole milk combined with dextrins and maltose, and incorporate Magnesium Trisilicate 3.5 grs.; Magnesium Oxide 2.0 grs.; Calcium Carbonate 2.0 grs.; Magnesium Carbonate 0.5 grs.; Ol. Menth. Pip. q.s.

BIBLIOGRAPHY:

The Control of Gastric Acidity. *Brit. Med. J.*, 26th July 1952, 180-182
Medical Treatment of Peptic Ulcer. *Med. Press*, 27th February 1952, 195-199
The Effect on Gastric Acidity of "Nulacin" Tablets. *Med. J. Aust.*, 28th November 1953, 823-824
Control of Gastric Acidity by a New Way of Antacid Administration. *J. Lab. Clin. Med.*, 1953, **42**:955.
Further Studies on the Reduction of Gastric Acidity. *Brit. Med. J.*, 23rd January 1954, 183-184
Clinical Investigation into the Action of Antacids. *The Practitioner*, July 1954, **173**:46

NULACIN

is available throughout the British Commonwealth, in the U.S.A., and many other countries. It is known as Nulactin in Canada and Sweden.

HORLICKS LIMITED

PHARMACEUTICAL DIVISION · SLOUGH · BUCKS

Evans Medical Supplies Ltd

INTRODUCE

NOBECUTANE

A NEW PLASTIC WOUND DRESSING

(*See* Brit. med. J. 1954. 2.17)

NOBECUTANE consists of an acrylic resin dissolved in a mixture of acetic esters. When applied to the dry skin the solvent evaporates leaving an elastic, transparent, and adhesive film.

* * *

NOBECUTANE has many advantages over conventional dressings. It is non-irritating, transparent, tough, pliable and durable and can be applied over joints where some degree of mobility is required.

* * *

NOBECUTANE is impervious to bacteria but permeable to air and water vapour and allows normal aqueous exhalation of the skin to escape and no maceration of the skin occurs.

* * *

NOBECUTANE is economical in use and results in a saving of at least 20% over the cost of conventional dressings. In addition it is welcomed by nursing staff who find it effects a considerable amount of saving in time.

* * *

NOBECUTANE is available to *hospitals only* in bottles of 250 ml. at a price of 17/6 per bottle. Each bottle contains adequate material for the dressing of approximately sixty to seventy surgical wounds.

Manufactured in Sweden by A. B. BOFORS NOBELKRUT

Packed and issued by the sole distributors

EVANS MEDICAL

EVANS MEDICAL SUPPLIES LTD

LIVERPOOL AND LONDON

A H

★ STERILON BRAND Catgut

★STERILON CATGUT

has the NEW SEMI-MATT FINISH

to MINIMISE KNOT-SLIP.

★STERILON CATGUT

IS UNAFFECTED BY AGE OR CLIMATE.

ALLEN & HANBURYS LTD LONDON E2

Makers of Quality Instruments

SHOWROOMS: 48 WIGMORE STREET LONDON W1

NEW

Convenil REGD.

(PHENYLETHYLACETIC ACID - β - DIETHYLAMINOETHYLESTER CITRATE)

Antispasmodic-Sedative

in Autonomic Nervous System Disorders

'Convenil'-Hommel is an entirely new preparation, synthesized in the Swiss Laboratories of Hommel, which provides a highly effective antispasmodic action with excellent tolerability and freedom from side-effects.

'Convenil' is put up in convenient dragees, each containing 150 mg. of the new active agent. It thus obviates the induction of the hypnotic effects of the common antispasmodics, since it is a single-drug prescription and does not depend upon any barbiturate content for its efficacy.

Clinical experiences of 'Convenil' prove its value in unblocking spasm in a wide variety of autonomic lesions including spastic functional disorder of the gastro-intestinal tract. In addition, 'Convenil' corrects peripheral vagosympathetic disturbance thus increasing the effect of soporifics. It is therefore a 'barbiturate saver'.

Investigations also show that 'Convenil' is useful in the management of postoperative spastic phenomena, neuroses and in the neurological side-effects of Isoniazid in tuberculosis.

INDICATIONS *These include: gastro-intestinal neuroses, spastic constipation, menstrual and menopausal disturbance, autonomic dysfunction generally, chronic alcoholism, nervous tension and irritability, cardiac dystonia, travel sensitivity, neurological side-effects of INAH therapy.*

DOSAGE *ADULTS: average 1 dragee two to four times daily; in special cases up to 6 dragees daily.*
CHILDREN: 1 dragee one to three times daily.

PACKINGS *Dragees 20's and 250's (dispensing).*

Samples and literature on request

HOMMEL, 121 NORWOOD ROAD, LONDON S.E.24.

HOMMEL

New

FIRST
SAFE AND EFFECTIVE
INTRAMUSCULAR IRON

BENGER LABORATORIES, who introduced the first intravenous iron preparation, now present a new and equally effective iron complex for intramuscular administration. ITS NAME IS IMFERON. The introduction of this new compound considerably simplifies the control of iron deficiency anæmias in both hospital and general practice. *Note these advantages . . .*

★ **Imferon** is the first safe and effective iron preparation for intramuscular injection—equally suitable for general practice and hospital use.

★ **Imferon** is well tolerated. Reactions of the kind which have been reported with saccharated oxide of iron have not been observed.

★ **Imferon** produces a haemoglobin response identical with that obtained by saccharated oxide of iron. The response is thus predictable.

★ **Imferon** provides the equivalent of 250 m.g. of iron per 5 ml. injection; fewer injections are therefore necessary to administer the calculated total dose.

AMPOULES 2 ml. (100 *mg. Fe.*) boxes 10 and 100. AMPOULES 5 ml. (250 *mg. Fe.*) boxes 5 and 50.
Fully-descriptive literature on request. A Technical Information Service is at your disposal.

Imferon TRADE MARK

Iron-Dextran Complex

A PRODUCT OF

BENGER

RESEARCH

BENGER LABORATORIES LIMITED · HOLMES CHAPEL · CHESHIRE

No Other Hypotensive Combines these...

12 IMPORTANT FEATURES

Veriloid, a product of Riker Laboratories research, is an alkaloidal extract of hypotensive principles obtained by fractionation from *Veratrum viride*. It is biologically assayed in mammals using reduction of arterial pressure as the criterion of potency.

VERILOID IN HYPERTENSION

1 Uniformly potent. Its constancy of pharmacological action permits calculation of exact dosage in milligrams . . .

2 A unique process of manufacture produces a tablet which dissolves slowly, assuring absorption and action over a considerable period . . .

3 Moderates blood pressure by vasorelaxant action independent of vagomotor effect . . .

4 No ganglionic or adrenergic blocking . . .

5 Lability of blood pressure, so important in meeting the demands of an active life, is not interfered with; no danger of postural hypotension . . .

6 Cardiac output is not reduced . . .

7 No compromise of renal function . . .

8 Cerebral blood flow is not decreased . . .

9 Tolerance or idiosyncrasy rarely develops . . .

10 Hence can be given over long periods with the aim of arresting or lessening progression of hypertension . . .

11 Well tolerated in properly adjusted dosage; does not occasion headache . . .

12 Produces a prompt and sustained reduction of blood pressure in all forms of hypertension . . .

Oral dosage forms: Veriloid (plain) in tablets of 1 mg. and 2 mg.
Veriloid-VP (Veriloid 2 mg. and Phenobarbitone 15 mg.).
Rauwiloid+Veriloid (Rauwiloid brand standardized alkaloids of Rauwolfia serpentina 1 mg. and Veriloid 3 mg.).

Parenteral solutions for the treatment of hypertensive crises, encephalopathy and similar conditions are also manufactured.

"Rauwiloid" and "Veriloid" are Registered Trade Marks.

Regd. Users:

RIKER LABORATORIES LIMITED, LOUGHBOROUGH, LEICS.

Descriptive literature available on request

Preparing for Winter

'Ro-A-Vit' Vitamin A

without the fishy flavour

For prophylaxis against upper respiratory infections

The majority of adults can obtain adequate liver reserves of vitamin A by taking 2 tablets of 'Ro-A-Vit' daily for two or three weeks. Such a course may be repeated after two or three months if required.

Children—One tablet daily for two or three weeks.

Packings :—Tablets (50,000 i.u.) 30 and 200

'Ronicol' β pyridyl carbinol

The vasodilator with fewer side-effects

For prophylaxis and treatment of chilblains

The regular use of 'Ronicol' during the colder months will often prevent the occurrence of chilblains. 'Ronicol' may also be used in the treatment of chilblains. The vasodilator effect is not accompanied by a marked fall in blood pressure and seldom are there other side-effects.

Dose—One or two tablets daily.

Packings :—Tablets (25mg.) 50 and 250
available also in Ampoules (100 mg.) 6 and 50.

ROCHE PRODUCTS LIMITED 15 MANCHESTER SQUARE LONDON W.1

PRISCOL

ORALLY ACTIVE

PERIPHERAL VASODILATOR

for

RAYNAUD'S DISEASE

OBLITERATIVE ARTERITIS

PERIPHERAL ARTERIOSCLEROSIS

Priscol is of value in all cases where spasm is present and where the collateral blood supply can be augmented.

TABLETS (25 mg.)
Bottles of 40, 200 and 1,000.

PARENTERAL SOLUTION (25 mg./1 c.cm.)
Boxes of 6 and 25 ampoules. 10 c.cm. R.C. Vials

Ointment	Ophthalmic Ointment	Solution
20g. 1 lb.	5g. tubes	10 c.cm. 100 c.cm.

CIBA

'Priscol' is a registered trade mark denoting 2-benzyl imidazoline hydrochloride
Reg. user

CIBA LABORATORIES LIMITED
HORSHAM · SUSSEX

Telephone: Horsham 1234 *Telegrams: Cibalabs, Horsham*

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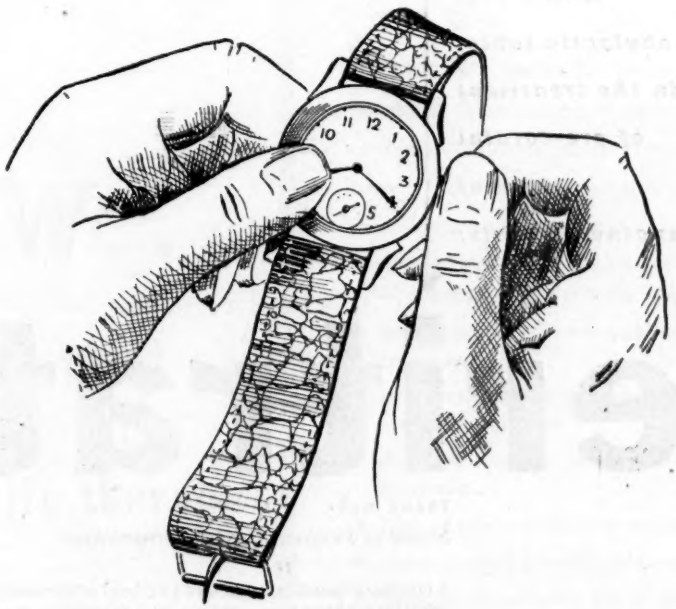

MAINTAINING DAY TO DAY RHYTHM

When the even timing of normal peristalsis is interrupted, day to day regularity of rhythm may be restored effectively by the administration of I-so-gel.

This natural laxative has a *smooth mechanical action* which stimulates normal peristalsis. I-so-gel does not contain purgatives.

I-so-gel is invaluable in the treatment of habitual constipation and is particularly suitable for elderly and convalescent patients and diabetics. It is also indicated in mucous colitis, dysentery, hæmorrhoids and intestinal flatulence.

After the performance of colostomy, I-so-gel gives excellent results by solidifying the fæces.

I-SO-GEL

GRANULES

In bottles of 5 oz. and 27 oz.

Literature on application.

ALLEN & HANBURYS LTD LONDON E 2

TELEPHONE BISHOPSGATE 3201 (20 LINES) TELEGRAMS "GREENBURYS BETH LONDON"

A new oral prophylactic tablet in the treatment of pre-cordial pain of angina pectoris:

Peritrate

TRADE MARK

brand of Pentaerythritol Tetranitrate

A coronary vasodilator, active ½ an hour after swallowing and effective for 4 to 5 hours. Each tablet is of 10 mg. strength.

Peritrate is a drug of considerable benefit in the prophylactic treatment of patients with coronary insufficiency, regardless of their age. The evidence of clinical trials indicates that in some cases Peritrate may protect completely against attacks; in others, the number of attacks is substantially reduced; while those attacks not prevented may be less intense and of shorter duration. Results so far obtained with Peritrate suggest that it is more efficacious than drugs such as aminophylline or khellin; also there are certain other beneficial effects which can be expected:

1. Less palpitation, especially at night.
2. Shortness of breath on effort, less severe.
3. An improvement of 50 per cent. in distance walked.
4. Reduction of nitroglycerin requirement.
5. The negative S-T segment shifts, ordinarily occurring after exercise, modified; Peritrate has returned the abnormal resting electro cardiogram towards normal in a significant number of cases.

DOSAGE 1 or 2 tablets (10 mg. or 20 mg.) 4 times daily.
PACKING AND PRICES Bottles of 50 and 500 tablets. Dispensing bottle of 500 tablets supplied to chemists at 9/- plus P.T. 2/3.

William R. Warner & Co. Ltd., Power Road, London, W.4

NEW..

effective local antibiotic therapy – minimal risk of sensitisation

'POLYFAX' combines 'Aerosporin' brand Polymyxin B Sulphate with Bacitracin in a new antibiotic ointment of *very wide antibacterial range*. 'Polyfax' has a prominent place in clinical practice because

- **'Polymyxin' is lethal to many gram-negative organisms, particularly *Ps. pyocyanea*.**
- **Bacitracin is effective against gram-positive organisms.**
- **Drug resistance to polymyxin is unknown, to bacitracin very rare.**
- **Penicillin-resistant strains often succumb to bacitracin.**
- **Risk of skin sensitisation is minimal.**
- **Local absorption is insignificant.**
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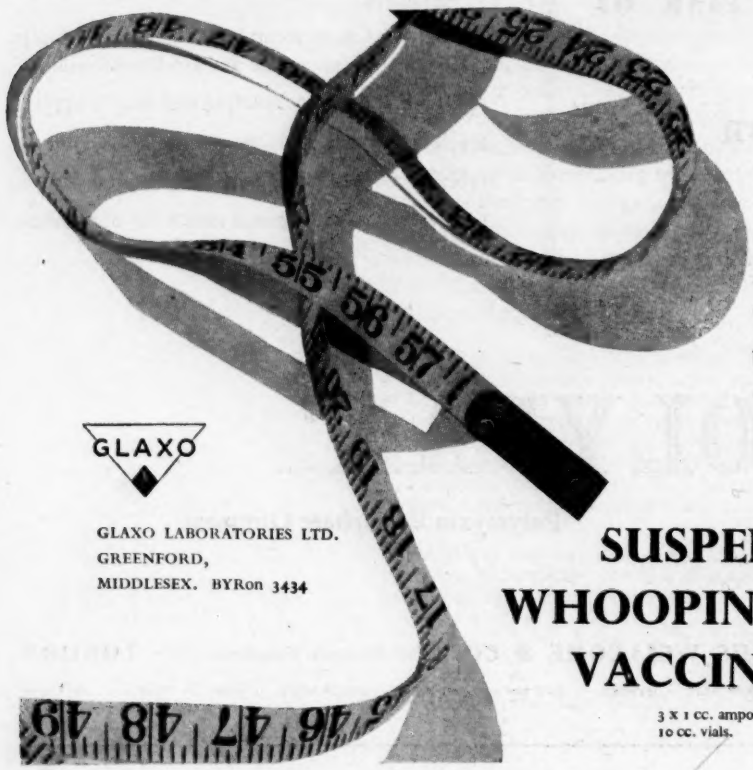

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INCOMPLETE PITUITARY INSUFFICIENCY

AN ESSAY IN DIAGNOSIS

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THE clinical syndrome in published cases where necropsy had disclosed destruction of all, or nearly all, of the pituitary gland by long-standing lesions was described by Sheehan and Summers (1949). To supplement this clear description of severe pituitary insufficiency, much work is needed on the heterogeneous clinical pictures which may unfold when the lesion is either less extensive (though symptoms appear only when some three-quarters of the anterior lobe is involved) or is of shorter duration. This topic has been discussed by several workers, including Sheehan and Murdoch (1938a), Sheehan (1939), Fraser and Smith (1941), Cooke and Sheehan (1950), Paschkis and Cantarow (1951), Oelbaum (1952), Maddock et al. (1953), and Schneeberg et al. (1953); but, considering that incomplete syndromes are probably much commoner than severe ones (Sheehan 1939), these have received less than their due share of attention. If they are neglected it is because they elude accurate definition and invite occasional diagnostic errors; indeed it may be quite impossible to prove the suspected pituitary lesion outside the necropsy room. It is, however, important that such a lesion should be detected, for the disability may be great and treatment is nearly always effective; and further knowledge of this broad and ill-defined field demands detailed clinical studies.

Inhibition of the intact pituitary gland from nutritional and psychological causes (Hubble 1952) and the selective, and probably inherited, defects of pituitary function which may occur without evidence of pituitary destruction (Hubble 1952, Albert et al. 1953) are not considered here.

Methods

Extensive clinical proformas were constructed so that the progress of individual symptoms and signs could be traced at two-monthly or three-monthly follow-up examinations. In each case, investigation included erythrocyte-sedimentation rate (E.S.R.), full blood-count with repeated hæmoglobin (Hb) estimations, blood Wassermann reaction (W.R.), fractional test-meal (F.T.M.), and radiographs of chest and skull.

Five tests of endocrine function were applied:

1. Basal metabolic rate (B.M.R.).—The open method was used. Calculations were based on the Aub-DuBois standards.

2. Plasma-cholesterol level.—A modification of the method of Bloor (1923) was used.

3. Kepler water-excretion test (Robinson et al. 1941).

4. Urinary 17-ketosteroids (Medical Research Council 1951).—In this laboratory normal values with this method are 5–15 mg. per twenty-four hours in women and 10–20 mg. in men.

5. Insulin-tolerance test (I.T.T.) (Fraser et al. 1941).—Blood-sugar levels (capillary) were estimated by the method of Nelson (1944). In view of the risk of severe hypoglycæmia, a preliminary test was done with one-third of the standard dose of insulin. If this was normal the test was repeated with the full dose. The normal values (table I) for both tests were obtained from patients (aged 17–60) whose carbohydrate metabolism was unlikely to be disturbed. Published data on the normal response to one-third of the standard dose are few. Our figures show that the sixty-minute sample provides an index of hypoglycæmia responsiveness, in that normally the blood-sugar level should have returned approximately to the fasting level by this time. The average maximal fall to 66% of the fasting level (i.e., the degree of insulin sensitivity) is greater than the 79% cited by Anderson (1950) for the same dose. The normal results for the full dose agree well with those given by Fraser et al. (1941) in their original description and by Fraser and Smith (1941).

Summarised Results

Some results are summarised in tables I and II. Abnormal results of investigations not included in these tables are given below.

Grouping of Cases

Sheehan and Summers (1949) have shown that the main features of severe pituitary insufficiency are failure of lactation in the puerperium, loss of sexual function, genital and breast atrophy, complete loss of pubic and axillary hair, lack of skin pigmentation and absence of sun-tanning, absence of sweating and of axillary greasiness, cold intolerance, weakness and torpidity, a tendency to hypoglycæmia and dangerous coma, a low B.M.R., very low 17-ketosteroid excretion, an I.T.T. characterised by insulin sensitivity and hypoglycæmia unresponsiveness, a positive Kepler test, and moderate anæmia. Thinning of the eyebrows and puffiness of the face are sometimes seen.

Incomplete syndromes might be expected to resemble severe ones, though lacking one or more of the main features. In fact the grouping of symptoms varies widely from case to case, and the course of the disease is variable (Sheehan 1939); so all manner of clinical forms are found. In the present small series two broad groups emerge: one showing predominant loss of sex function, and the other predominant "cold syndrome"—a convenient term used by Sheehan and Murdoch (1938a) to indicate a variable combination of cold intolerance, asthenia, and apathy.

PREDOMINANT LOSS OF SEX FUNCTION

Case 1.—A married woman, aged 41. In 1948 poor vision and scanty menstruation had led to the finding of bitemporal

TABLE I—INSULIN-TOLERANCE TESTS IN PATIENTS AND CONTROLS

Case and dose of insulin	Fall in blood-sugar at intervals after administration of insulin*						Factor of responsiveness	Remarks
	20 min.	30 min.	45 min.	60 min.	90 min.	120 min.		
22 controls; 1/3 standard dose (mean values ±S.D.†)	68·0 ±9·2	77·1 ±10·9	92·3 ±6·9	95·5 ±6·6	.. ..	.. ..	.. ..	Max. fall to 65·6% (±8·4) of fasting level
26 controls; full dose (mean values ±S.D.†)	51·8 ±8·3	48·7 ±7·7	74·0 ±12·0	84·6 ±12·0	94·3 ±9·1	99·3 ±6·8	548 ±43·4	Max. fall to 46·6% (±6·8) of fasting level
Case 1 (1/3 dose)	64	64	77	79	..	..	..	Mild hypoglycæmia unresponsiveness
Case 2 (full dose)	36	48	68	71	77	84	460	Doubtful hypoglycæmia unresponsiveness
Case 3 (full dose)	44	58	70	64	82	83	463	Doubtful hypoglycæmia unresponsiveness
Case 4 (full dose)	50	36	62	69	82	90	474	Just within normal limits
Case 5 (1/3 dose)	35	55	73	110	..	..	..	Increased insulin sensitivity
Case 6 (full dose)	73	54	77	81	94	92	529	Normal
Case 7 (full dose)	53	53	84	95	102	104	593	Normal
Case 8 (full dose)	43	42	57	70	87	92	484	Normal

*The level is expressed as a percentage of the fasting level. †The normal limits found corresponded closely to 2 S.D.

TABLE II—GENERAL DATA AND SOME LABORATORY FINDINGS

			Case no.							
			1	2	3	4	5	6	7	8
Age (yr.)			41	36	44	27	62	42	39	47
Sex			F	F	F	M	F	F	F	F
Weight (lb.)			91	90	107	131	102	100	130	157
Height (in.)			60	55·5	62	68	65·5	59·5	62	63
Blood-pressure (mm. Hg)			84/66	90/50	130/90	110/70	130/75	110/80	90/60	130/95
Hæmoglobin % (Haldane)			64	64	80	78	92	72	78	66
Erythrocyte-sedimentation rate (mm. in first hour, Westergren)			18	109	12	7	15	5	24	18
Plasma-cholesterol level (mg. per 100 ml.)			203	198	250	250	136	180	144	206
Basal metabolic rate (%)			−26	..	−27	−29	−30	−26	−35	−26
Kepler test	Procedure 1	"Night" vol. (ml.)	390	450	340	280	252	470	340	118
		Greatest "day" vol. (ml.)	180	60	175	30	130	150	100	534
	Procedure 2	Index	22	5·5	24	6·6	12·2	22	18·8	..
Urinary 17-ketosteroid excretion (mg. per 24 hours)			0·26 and 0·17	0·50 and 0·50	0·78 and 1·28	5·80 and 5·50	1·0 and 1·60	1·50 and 1·50	1·20 and 0·63	0·60 and 0·66

hemianopia, the removal of a highly cellular craniopharyngioma, and the giving of deep X-ray therapy to the pituitary region. The patient did not menstruate again. After the operation she vomited frequently, and her weight fell in two months from 98 to 74 lb. Thereafter her weight rose gradually to 86 lb., but she complained of anorexia, cold intolerance, and shortness of breath; and, while remaining active and remarkably cheerful, she lost interest in, and abandoned, her profession of portrait photography. In 1952 she went to West Africa, where she had malaria and diarrhœa. On her return home in August, 1953, she had another attack of diarrhœa, followed by a respiratory infection.

She was an intelligent, pleasant person who looked tired and delicate. Although her trunk and limbs were deeply sun-tanned, her face showed an even greyish-brown pallor. The skin was smooth, and on the legs atrophic. The eyebrows were sparse, the axillæ hairless and almost dry, and the pubic hair sparse. The breasts were normal. The uterus was extremely small. She retained nineteen teeth. The visual fields were full. No malarial parasites were found. The fæces were normal.

One-day bouts of diarrhœa and vomiting, without collapse, occurred on Sept. 8 and Oct. 3, 1953. Details of treatment are shown in fig. 1. The extra salt caused nausea. The addition of deoxycortone acetate was associated with rises in blood-pressure and weight which persisted after cortisone was discontinued. Slight ankle œdema was noted on Nov. 9, but disappeared when extra salt was discontinued. The increase in E.S.R., though most pronounced during bouts of diarrhœa, was never satisfactorily explained. The patient's desire to stay only a short time in hospital prevented adequate study of the effects of individual drugs. The E.S.R. became normal after the addition of cortisone and deoxycortone acetate and rose again when cortisone was withdrawn while other drugs were continued. The hæmoglobin rose from 64 to 90% in three months. Treatment has resulted in a great increase in strength and well-being.

This case was fairly severe but of relatively short duration. The incompleteness of the syndrome was evident in the lack of any great personality change; in the patient's ability to resist infections without hypoglycæmic symptoms or collapse; in the tanning of the skin; and in the absence of insulin sensitivity.

Case 2.—A married woman, aged 36. The patient's fifth pregnancy culminated in the birth of twins and severe postpartum hæmorrhage. A blood-transfusion was given, and a retained placenta was removed manually, in her own home. The breasts were not engorged, and she had no milk. She spent a month in hospital with puerperal sepsis. Seen nine months after the confinement, she complained of amenorrhœa, severe cold intolerance, some weakness and breathlessness, and loss of 14 lb. in weight. She was spirited, alert, and quick to show her feelings, with a good voice, a ready smile, and a firm expression. Her face was extremely pale, and her skin smooth, notably lacking in pigmentation; she had poorly pigmented *erythema ab igne* on the legs, dry axillæ, very sparse axillary and pubic hair, normal breasts with wide, deeply pigmented areolæ, and extreme hyperinvolution of the uterus. Radiographs showed infiltration in the upper zones of both lungs, and a cavity in the right lung. Tubercle bacilli were found in the sputum.

Testosterone 600 mg. and deoxycortone acetate 200 mg. were implanted. For the next eleven months the patient was nursed in a sanatorium, where treatment included a four-month course of streptomycin and *p*-aminosalicylic acid, followed by the induction and maintenance of a pneumoperitoneum. In view of persisting hypotension (blood-pressure 80/40 to 90/50 mm. Hg), additional deoxycortone

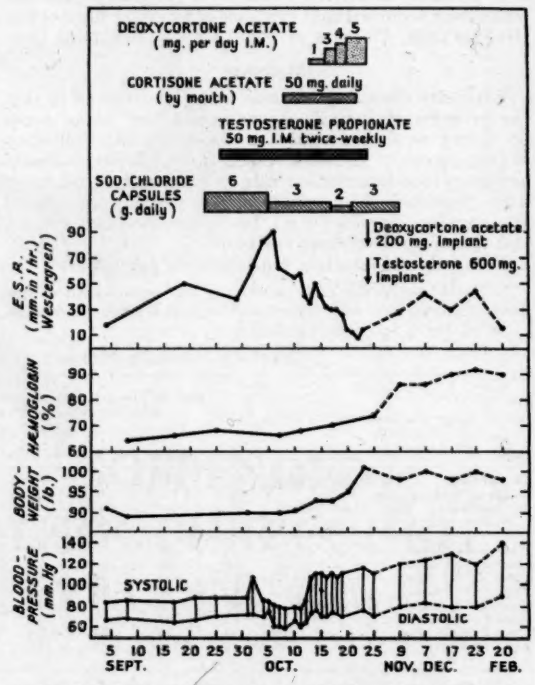
DEOXYCORTONE ACETATE (mg. per day I.M.)
1 3 4 5
CORTISONE ACETATE 50 mg. daily (by mouth)
TESTOSTERONE PROPIONATE 50 mg. I.M. twice-weekly
SOD. CHLORIDE CAPSULES (g. daily)
6 3 2 3
Deoxycortone acetate 200 mg. implant
Testosterone 600 mg. implant
E.S.R. (mm. in 1 hr.) Westergren
90 70 50 30 10
HAEMOGLOBIN (%)
90 80 70 60
BODY-WEIGHT (lb.)
100 95 90
BLOOD-PRESSURE (mm. Hg)
140 120 100 80 60
SYSTOLIC
DIASTOLIC
5 10 15 20 25 30 5 10 15 20 25 9 7 17 23 20
SEPT. OCT. NOV. DEC. FEB.

Fig. 1—Effects of treatment on erythrocyte-sedimentation rate, hæmoglobin, blood-pressure, and weight (case 1).

acetate (2–5 mg. daily) and salt capsules (3–6 g. daily) were given during the first four months; but the blood-pressure rose only slightly.

During a two year follow-up the patient has received three further implants of testosterone 600 mg. Cold intolerance has gone; there has been a great increase in strength and appetite; and skin colour and pigmentation, body hair, and axillary sweating have been restored. The hæmoglobin has risen from 64 to 96% and body-weight from 90 to 110 lb. The blood-pressure has been maintained at 90/50 to 110/70 mm. Hg without salt or deoxycortone acetate. Radiographs show considerable healing of the pulmonary tuberculosis. A recent Kepler test was strongly positive (index 1·8).

It is likely that the patient suffered severe postpartum pituitary necrosis, and that, because of its short duration the syndrome was incomplete. Pulmonary tuberculosis must have accounted for some of the symptoms, but probably not for the extreme genital atrophy and loss of body hair without much weight loss. Hypotension was not accompanied by comparable asthenia and was not greatly influenced by deoxycortone acetate and salt.

Case 3.—A married woman, aged 44, when seen in 1951. Menstruation had started when the patient was 15, had ceased between the ages of 16 and 18, and had been scanty and irregular thereafter. Her only confinement, in 1931, was normal, and she had breast-milk; but complete amenorrhœa and loss of libido ensued. In 1933 a gynæcologist recorded that he inserted a pessary for retroversion of the uterus. She disliked the cold, but remained cheerful and remarkably active, working as a cleaner from 5 A.M. to 1 P.M., doing her housework in the afternoon, and often enjoying country dancing in the evenings. Hot flushes occurred from 1947 to 1950.

Her skin was soft and moderately pale, but her cheeks were pink. The breast areolæ were pale. Axillary and pubic hair were completely absent. There was severe hyperinvolution of the uterus and genital tract; and a vaginal smear showed very little glycogen in scanty squames. Radiographs showed fibrosis and some calcification in the upper lobe of the right lung. Animal inoculation of gastric contents was negative for tubercle bacilli. The Mantoux test (1 : 1000) was positive. She had been treated for two and a half years with implants of testosterone 600 mg. every five or six months. After seven months she did not mind the cold, pubic hair was growing, and the hæmoglobin had risen from 80 to 92%. The addition of thyroid and œstrogens for the next twenty-one months appeared to have no further effects, other than to increase the size of the uterus and genital tract. The hæmoglobin has gradually risen to 106%.

The laboratory tests supported the diagnosis of pituitary insufficiency, which was clinically apparent only in the severe genital atrophy and complete absence of body hair. The patient's energy and activity were quite astonishing. The cause of the pituitary lesion is not known: although amenorrhœa followed a normal confinement, genital hyperinvolution must have developed slowly since retroversion of the uterus needed to be corrected two years later.

Case 4.—A man, aged 27, married with one child, aged 3, had been in good health, apart from mild dyspepsia, until the spring of 1949. He then complained of headaches, dizziness, poor sleep, anorexia, vomiting, gradual loss of sexual libido and potency, loss of weight and strength, diminished growth of hair on the face, cold intolerance, and pallor. He had attacks of jaundice in August, 1949, and January, 1950.

On examination in April, 1951, he was found to be alert but timid, with a very pale, finely wrinkled face, soft profuse scalp hair, sparse outer eyebrows and beard, and sparse axillary, pubic, and limb hair. The genitalia and prostate were small. He had internal hæmorrhoids. Radiographs showed considerable enlargement of the pituitary fossa with slight erosion of the left clinoid processes. Radiographic examination after a barium meal revealed a duodenal ulcer, but gastric acidity was normal and benzidine tests of fæces were negative. Liver-function tests and cholecystography gave normal results.

The patient was given deep X-ray therapy to the pituitary, and testosterone 800–1200 mg. has been implanted every five to six months. Deoxycortone acetate 200 mg. was implanted in November, 1951, and again in March, 1952, and extra salt and thyroid gr. 1 daily were given until December, 1952. Intermittent anorexia and vomiting continued until November, 1951, when the patient had a recurrence of jaundice which was treated at home. Since then he has remained extremely well and has lost all symptoms. There has been a great increase in muscular strength and a return of masculine attributes. The hæmoglobin, after increasing from 78 to 102% in fifteen months, has since ranged from 84 to 106%. His weight rose to 167 lb. in two and a half years and has since been maintained at about 154 lb. The blood-pressure has remained in the region of 130/90 mm. Hg on treatment with testosterone alone.

Excretion of 17-ketosteroids was not absent, and the insulin-tolerance test showed no gross abnormality. This patient appears to have had recurrent hepatitis; but because of the presence of a pituitary tumour and the absence of evidence of hepatic cirrhosis, pituitary insufficiency, and not liver disease, was probably responsible for the loss of sex function.

PREDOMINANT "COLD SYNDROME"

Postmenopausal Case without Genital Hyperinvolution

Case 5.—A married woman, aged 62. After the second of her five confinements the placenta had been removed manually, and she had been pale and weak for the next six months. None of her babies was breast-fed. Her periods stopped when she was 47 and she did not have menopausal symptoms. When seen, she complained of long-standing weakness and fatigue, frequent colds and bronchitis, breathlessness on exertion, periodic dyspepsia, nocturnal leg-cramps, and symptoms of Raynaud's syndrome in the fingers. For about three years she had been very tired, had felt the cold greatly, and had had generalised aches and pains.

Although she complained a great deal she was pleasant enough; she did not look unduly ill. Her face was wrinkled and of an even pale-grey colour. Her skin was smooth, unusually thin, and loose; it had a faint generalised pigmentation, and the breast areolæ and the widespread *erythema ab igne* of the legs were deeply pigmented. The eyebrows were sparse, the axillæ dry and hairless, and the pubic hair very sparse. Little breast parenchyma could be felt. There was no hyperinvolution of the genitalia.

Old calcified apical tuberculosis was found radiographically; the tuberculin test (1 : 1000) was weakly positive; and animal inoculation of gastric contents was negative for tubercle bacilli. There was no evidence of sarcoidosis from radiographs of hands and feet. Radiography after barium meal showed a duodenal ulcer, and there was gastric hyperchlorhydria.

Five months after an implant of testosterone 600 mg. the patient was free from cold intolerance, tiredness, weakness, and dyspepsia. There was some colour in her face, which was fuller and firmer. Blood-pressure was 130/70 mm. Hg; weight 114 lb.; hæmoglobin 98%.

When pituitary insufficiency occurs after the menopause and is associated with many vague complaints, its presence may be overlooked unless lack of body hair is noted. In the present case the clinical diagnosis is amply supported by the laboratory findings, but the ætiology is obscure. The absence of genital hyperinvolution is of interest.

Cases without Loss of Sex Function or Genital Atrophy

Case 6.—A married woman, aged 42, was seen on July 25, 1951. Severe postpartum bleeding had occurred after all her three confinements; the first, in 1935, was also complicated by puerperal sepsis, and after it she was pale, weak, and unwell. Good health returned with her second pregnancy in 1938, and was maintained until her last delivery in 1945, after which she became pale, weak, irritable, depressed, and always cold, slept badly with restlessness of the legs at night, and had attacks of Raynaud's syndrome in the fingers, and occasional hot flushes. Her skin became dry and lifeless, and her hair "like dry grass." After 1945 menstruation was irregular and profuse, with painful clots. Although some milk had been present, she did not breast-feed any of her babies.

She was thin, timid, and fragile-looking, with sparse outer eyebrows and straight dry hair. Her face was pale, with a malar flush, and finely wrinkled (fig. 2a). On a summer day she complained grievously of cold, and wore long thick

(a) (b)

Fig. 2—Appearance of patient (case 6): (a) before treatment; and (b) three months after start of treatment.

socks in bed. The skin of the forearms and abdominal wall was rough and scaly. Axillary hair was profuse, but the pubic hair was thinning. The breasts and genitalia were normal. Glycogen was present in moderate amount in the vaginal squames.

Apart from oral iron the only treatment was an implant of testosterone propionate 600 mg. on Aug. 23, 1951. On Nov. 12, 1951, her appearance was transformed (fig. 2b). She was cheerful and confident, with firm features and soft, smooth skin and hair; and she reported a great increase in strength, well-being, and appetite. Her weight had risen to 108 lb. and her hæmoglobin to 94%.

Since then she has received implants of testosterone 400 mg. or 600 mg. every five or six months, and the improvement has been maintained. Administration of thyroid extract in doses of up to gr. 3 daily for one year from Dec. 6, 1951, was associated with a fall in weight to 93 lb., without other effects. Since the thyroid was stopped, her weight has risen to 104 lb. Cold intolerance and roughness of the skin recurred before one of the implants, but were relieved after it. Since the start of treatment, menstruation has been scanty and infrequent, and the features of Raynaud's syndrome and "jittery legs" have disappeared. The hæmoglobin has varied from 94 to 106%.

Case 7.—A married woman, aged 32, was first seen on Feb. 6, 1947, in the thirtieth week of her sixth pregnancy, throughout which she had complained of abdominal pain, anorexia, and cold intolerance. Her first confinement in 1934 had been followed by postpartum hæmorrhage, and she had been unable to breast-feed any of her babies. She was pale; the skin was dry on the forearms; the axillary and pubic hair were scanty; and the breasts were not enlarged or congested. Hæmoglobin was 56%; B.M.R. −5%; Kepler index 11·7; urinary 17-ketosteroids 3·7 and 4·3 mg. per twenty-four hours; and an insulin-tolerance test showed insulin resistance (with the full dose the maximum fall was only to 75% of the fasting level) and a tendency to hypoglycæmia unresponsiveness. A urinary infection with *Escherichia coli* was treated. She was given thyroid gr. 1 daily. The confinement proved uneventful and so did her last confinement in 1948. She did not continue with thyroid.

She was seen again in November, 1952, when she complained of heavy periods, cold intolerance, sleepiness, diminished sweating, and breathlessness on exertion. Her face was remarkable for its even and unrelieved greyish pallor and scanty outer eyebrows. The skin was rough and scaly, but there were no myxœdematous swellings. Axillary and pubic hair were very sparse. The breast areolæ were pale and *erythema ab igne* on the legs was of a light-red tint. There was no genital atrophy. Fractional test-meal showed a histamine-fast achlorhydria. Other investigations are listed in table I.

Her only treatment was an implant of testosterone 600 mg. on Dec. 2, 1952. On April 30, 1953, she said she was "a different woman," feeling strong and cheerful and able for all her housework, eating well, and not minding the cold at all. Only one menstrual period had occurred since the implant. She seemed self-confident; there was some colour in her cheeks; her skin was not so rough; and pubic and axillary hair were growing. She has remained well on testosterone implants. The later addition of thyroid has yielded no further benefit. The hæmoglobin has risen to 92%, and body-weight to 144 lb.

These two cases illustrate the difficulty of distinguishing between primary hypothyroidism and pituitary insufficiency by the methods we have used. In case 6 the symptoms were clearly related to obstetric shock, and the clinical course suggests severe pituitary necrosis after the first confinement, hypertrophy of the remaining pituitary tissue during the second pregnancy, and a second, severe, necrosis with the last delivery. In case 7 the remarkable even facial pallor, the severe loss of body hair, and the history of postpartum hæmorrhage pointed to the possibility of a pituitary lesion. But in neither case is the evidence conclusive. A positive Kepler test (Despopoulos and Perloff 1950) and negligible 17-ketosteroid excretion (Fraser and Smith 1941) may be found in primary hypothyroidism. In case 7 the insulin-tolerance test had shown insulin resistance during a pregnancy, but the test was normal six years later; although a positive result is usually supposed to indicate primary hypothyroidism, we have met insulin resistance in an otherwise typical case of Sheehan's syndrome (Wilson 1953) in which a maximum fall to 63% of the fasting level occurred forty-five minutes after injection of the full dose. The normal plasma-cholesterol levels may be more in keeping with secondary than with primary hypothyroidism (Lerman and Stebbins 1942, Paschkis and Cantarow 1951). The occurrence of pregnancy is of no diagnostic help. Rare instances of multiple pregnancy have been recorded both in untreated myxœdema (Hodges et al. 1952) and in hypopituitarism. In hypopituitarism pregnancy is usually thought to cause a temporary or permanent improvement (Sheehan and Murdoch 1938b and 1939, Bishop and de Mowbray 1951, Murdoch and Govan 1951), but there is some evidence that symptoms may not be relieved or may be aggravated by a subsequent normal pregnancy and delivery (Jakob 1923, Sheehan and Murdoch 1938b, Farquharson et al. 1938, Heyde 1953). In each of the present cases testosterone gave dramatic relief of all the symptoms and signs which might have been attributed to hypothyroidism. This in itself might be held to indicate pituitary insufficiency, but we still have no information about the effect of testosterone on hypothyroid patients in this age-group; one severely myxœdematous woman, aged 74, showed no response during the four months after we implanted testosterone 800 mg. If our diagnosis of hypopituitarism is correct in cases 6 and 7 the menorrhagia and lack of genital atrophy are of great interest, because complete loss of sex function is said to occur always with severe lesions (Sheehan and Summers 1949) and to precede other manifestations with incomplete syndromes (Hubble 1952).

The last case is of doubtful significance but seems worth recording.

Case 8.—A widow, aged 47, had for two or three years had aches and pains, tiredness, cold intolerance, and irregular, sometimes heavy, periods. She had had a postpartum hæmorrhage seventeen years before. Her face was extremely white, out of all proportion to her hæmoglobin of 66%. There were no other abnormal clinical findings and certainly no evidence of hypothyroidism. Investigation showed a low B.M.R. and almost absent urinary 17-ketosteroids. Her hæmoglobin rose to 96% on iron and thyroid, but facial pallor was still striking.

The somewhat fanciful suggestion that a white face might be the sole clinical sign of Sheehan's syndrome seems to be supported by the very low 17-ketosteroid excretion.

Discussion

The only clinical feature common to all the present cases was cold intolerance. Asthenia, never severe, was notably absent in case 3. Psychic changes attributable to

an endocrine disturbance were found only in cases 4 and 6. A most striking feature in four cases was the even pallor of the face, greyish in cases 1, 4, and 5, and white in case 8; in the others pallor was relieved by a malar flush. Cases 4 and 6 showed fine wrinkling and case 5 deep wrinkling of the face. The skin was rough in cases 6 and 7. Myxœdematous swellings were not seen. Loss of sexual function was prominent in case 4 (male) and in cases 1, 2, and 3, where involution of the uterus was extreme; but the findings in cases 6 and 7 suggest that significant hypopituitarism may occur without loss of sexual function or genital atrophy. The breasts were normal in the women apart from atrophy of the parenchyma in case 5 (an older person) and poor areolar pigmentation in cases 3 and 7. Body hair was absent or sparse in all but cases 6, 7, and 8.

Only in cases 6 and 7 was the moderately depressed B.M.R. associated with features suggestive of hypothyroidism; and these features were modified or abolished by testosterone alone. *Plasma-cholesterol* levels were normal. The *Kepler test* was positive in procedures 1 and 2 in all but the uncertain case 8, and was unaffected by treatment in cases 2, 3, 4, 6, and 7. In no case was the *insulin-tolerance test* (table I) of any real diagnostic aid. The abnormalities found in cases 1 and 5 were slight. Apparently the defects of carbohydrate metabolism revealed by this test in the fully developed syndrome are not present to nearly the same extent in some incomplete forms; in the present series this is reflected in the absence of any symptoms of spontaneous hypoglycæmia. On the other hand, urinary *17-ketosteroid* excretion in the seven female patients was extremely low, averaging 0·9 mg. in twenty-four hours, which supported the clinical diagnosis. In this laboratory we have found equally low values only in severe pituitary insufficiency, severe myxœdema, and some cases of Addison's disease.

An increased E.S.R. was thought to be due to pulmonary tuberculosis in case 2, and to recent mild infections in cases 3, 5, 7, and 8 where normal readings were obtained later. In case 1, although mild infection occurred and although some latent chronic infection could not be excluded, the persistently increased rate was not satisfactorily explained. One of us (Wilson 1953) has already noted unexplained increase of the E.S.R. in severe pituitary insufficiency; and Simpson (1953a and b) has recorded an increased E.S.R. in some patients with Addison's disease without obvious infection and its reduction after administration of cortisone. The possibility that cortisone lowered the E.S.R. in case 1 (fig. 1) is therefore of interest.

A very mild or moderate *anæmia* was present in all cases except case 5: blood-films showed that this was normocytic and normochromic in cases 3 and 4, normocytic and hypochromic in case 6, and slightly microcytic and hypochromic in the others. Without exception, the hæmoglobin levels rose to normal with treatment. In five cases the anæmia and its cure could not be ascribed to endocrine influences: pulmonary tuberculosis in case 2, severe menorrhagia in cases 6, 7, and 8, and a peptic ulcer and hæmorrhoids in case 4 may all have affected the hæmoglobin levels. In case 1, however, the hæmoglobin level rose from 64 to 90% during three months of combined hormonal treatment (fig. 1); and in case 3 from 80 to 92% in seven months on testosterone alone, followed by a rise to 106% in the next two years on combined treatment. Neither patient received iron. McCullagh and Jones (1942) showed that androgens were effective against the anæmia of eunuchoid patients, but Daughaday et al. (1948) found that patients with hypopituitarism did not respond uniformly well to thyroid and testosterone. In Summers's (1952) series cortisone was the only effective agent against the anæmia of severe hypopituitarism.

Significant gains in body-weight occurred in case 2 (12 lb. in six months), case 4 (36 lb. in two years), case 5 (16 lb. in nine months), and case 7 (11 lb. in five months); in the last three cases administration of testosterone appeared to be responsible for this gain.

Testosterone was the mainstay of treatment in the first seven cases, and results were most gratifying. The large doses used in the female cases did not lead to acne, hirsutism, or excessive libido; and this may suggest that the diagnosis was correct, since there is said to be little tendency to masculinisation from administration of the drug to women with Simmonds's disease (Turner 1950). In cases 2, 3, 4, 6, and 7 the addition of thyroid, with or without deoxycortone acetate and salt, seemed to afford no additional benefit. There seemed to be no necessity for the addition or substitution of cortisone or corticotrophin in long-term treatment; and possibly these drugs should be reserved for severe cases with recurring hypoglycæmic symptoms, or other complications which do not respond to other therapy.

The present cases show that, even after careful weighing of the evidence, a firm diagnosis of incomplete pituitary insufficiency may be difficult to reach when the manifestations are few (case 8) or when no clear cause is apparent (cases 3, 5, and 7), or when controversial issues are raised (cases 6, 7, and 8); and that, even when appropriate symptoms accompany a pituitary tumour or begin abruptly after obstetric shock, the presence of other diseases may divert attention from an endocrine lesion (cases 2 and 4). Such difficulties should not obscure the need for recognition and study of this condition, for which effective treatment is available.

Summary

Eight cases (one male and seven female) are described in which there was reasonable evidence of incomplete failure of pituitary function.

The nature and severity of the clinical features attributable to endocrine deficiency varied widely. Significant hypopituitarism may occur without loss of sex function or genital atrophy.

The characteristic laboratory findings were a low basal metabolic rate, extremely low or absent urinary excretion of 17-ketosteroids in females, and (in seven cases) a positive Kepler water-excretion test. The insulin-tolerance test was usually normal.

In such incomplete syndromes the diagnosis may not be readily apparent, and it may be difficult to confirm; but every effort should be made to recognise this disorder, in view of the gratifying response to therapy.

We wish to thank Dr. Ian Gordon, Dr. T. N. Morgan, and Dr. C. D. Needham for permission to study patients under their care; Dr. A. Lyall for helpful advice; and Mr. R. G. M. Drummond for the photographs.

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EFFECT OF CORTISONE ON CALCIUM METABOLISM IN SARCOIDOSIS WITH HYPERCALCÆMIA

POSSIBLY ANTAGONISTIC ACTIONS OF CORTISONE AND VITAMIN D

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HYPERCALCÆMIA occurs in a small proportion of patients with Boeck's sarcoidosis. Symptoms related to this are usually present with evidence of renal failure (Van Creveld 1941, Schupbach and Wernly 1943, Klinefelter and Salley 1946, Westra and Visser 1949, Longcope and Freiman 1952). In a preliminary study of one case (Dent et al. 1953) the dramatic effect of cortisone on the plasma-calcium levels, hypercalcæmic symptoms, and renal function was described (see also Lovelock and Stone 1951, Shulman et al. 1952). This observation has now been repeated on the same case and on three further cases with substantial confirmation of the earlier results. In addition we have now made calcium-balance studies under full metabolic control in three of these cases. This has enabled us to study further the pathogenesis of this disorder and the nature of the cortisone effect.

Methods

Calcium was determined by permanganate titration of the precipitated oxalate, in plasma according to Clark and Collip (1925), in urine according to Shohl and Pedley (1922).

The calcium-balance studies were all done in our metabolic ward on the general principles laid down by Reifenstein et al. (1945). The patients were given a diet which was maintained unaltered throughout the period of the balance study but was, in the first instance, composed so as to accord with their own preferences and with our requirement of mineral intake. After a period of six days for equilibration, collections of urine and stools were begun. Carmine markers were used, the stools being bulked and analysed in six-day periods. A complete day's diet was analysed several times during each balance period. Vitamin D was given as pure calciferol made up in tablets with lactose. Some of the commercial vitamin-D tablets are made up with calcium phosphate, of which fair-sized particles may be recovered from the stools. In the studies in which only plasma levels and renal function were investigated the patients were in a general ward with calcium intake calculated from tables and maintained only approximately constant.

Case-reports

Case 1.—A male teacher, aged 36, was admitted to Hammersmith Hospital, under Dr. G. Bull, in July, 1950, complaining of fatigue, weakness, frequency of micturition, and dyspnœa on exertion for the past year. From October, 1949, to February, 1950, he had taken small doses of cod-liver oil.

* M.R.C. Fellow in Clinical Research.

No enlarged lymph-nodes nor spleen were palpable, nor were other physical signs found on clinical examination. Radiography of the chest revealed enlarged hilar glands and reticulation of the lung fields suggesting sarcoidosis. Urine showed a trace of protein. Blood-urea 80 mg. per 100 ml.; urea clearance 30% of normal. Mantoux 1/1000 negative. Serum-calcium 12·6 mg. per 100 ml. The patient was given vitamin D 9000 units daily for twelve days. His serum-calcium level had risen to 14·8 mg. per 100 ml. after seven days and to 16·3 mg. per 100 ml. after twelve days. No further vitamin D was given.

Readmitted in July, 1951, feeling more tired, he had ankle œdema, his spleen was enlarged, and small lymph-nodes were palpable in his neck, axillæ, and groins. His serum-calcium level was 13 mg. per 100 ml.; serum-inorganic phosphorus level 3·8 mg. per 100 ml.; alkaline phosphatase 8·1 King-Armstrong units per 100 ml.; blood-urea level 129 mg. per 100 ml.

In September, 1951, he was found to have developed skin lesions of sarcoidosis. After discussion between Dr. Bull and one of us, treatment with cortisone was begun. This led to considerable clinical improvement. The rash disappeared, and radiography showed decreased infiltration of the lung fields. His plasma-calcium level fell to normal (fig. 1, no. 1), and renal function improved.

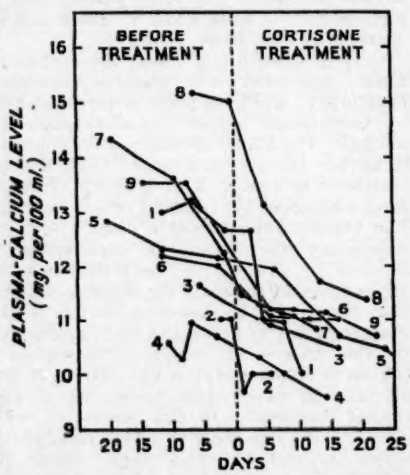

Fig. 1.—Plasma-calcium levels before and after treatment with cortisone: 1–4, case 1; 5 and 6, case 3; 7 and 8, case 4; 9, case 2 (see case-reports for dates). The part of curve 7 before treatment with cortisone was obtained while on low-calcium diet.

In July, 1952, he was readmitted to Hammersmith Hospital with a recurrence of his skin rash and other symptoms. His Hb was 55%; blood-urea level 175 mg. per 100 ml.; serum-calcium level 11 mg. per 100 ml. After a short course of cortisone his Hb slowly increased to 78% and blood-urea level fell to 90 mg. per 100 ml., and his serum-calcium level fell (fig. 1, no. 2).

He was transferred for follow-up to University College Hospital and admitted there in March, 1953, for further investigation. He there had a recurrence of his rash and felt breathless, tired, and weak, and had nocturia and frequency of micturition. His urine contained a trace of protein; his blood-urea level was 102 mg. per 100 ml.; and plasma-calcium level 11·3 mg. per 100 ml. No tubercle bacilli were found in the sputum. Mantoux 1/100 negative. Radiography showed widespread mottling of both lung fields. The plasma-calcium level fell after a further course of cortisone (fig. 1, no. 3). There was no change in his chest radiography. His urea clearance before and after treatment was about 20% of normal.

After treatment with cortisone was discontinued, his plasma-calcium level slowly rose to 12·2 mg. per 100 ml. and blood-urea level to 114 mg. per 100 ml. He was readmitted in October, 1953, for further investigation of the action of cortisone and vitamin D, cortisone supplies now being adequate for maintenance therapy if indicated. He volunteered this time to be given a dose of calciferol similar to that which had so easily intoxicated him in 1950. We were anxious to discover whether he was still sensitive to it and, if so, whether the cortisone would neutralise its action. He again felt tired and listless, and his rash had returned. His metabolic balance data and the effect on them of the calciferol and cortisone are shown in fig. 2. While he was on cortisone, his plasma-calcium level again fell (fig. 1, no. 4) in spite of the simultaneous administration of calciferol. He was given a maintenance

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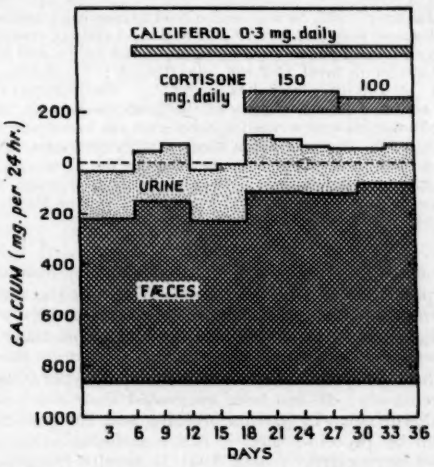

Fig. 2—Calcium balance in case 1. Daily intake is measured downwards from, and output upwards towards, zero line (Reifenstein et al. 1945).

dose of cortisone (75 mg. a day) in view of his previous relapse, and this was gradually reduced to 50 mg. a day. In May, 1954, his urea clearance was 17% of normal and his blood-urea level 126 mg. per 100 ml., he felt active and well, nocturia had lessened, and his plasma-calcium level remained normal.

Case 2.—A schoolboy, aged 14, had had poor vision with his left eye and a squint nearly all his life and had worn spectacles since the age of 9 years. In October, 1951, he felt a pricking sensation in the eyes, which became red. Since then his vision became blurred and deteriorated, with the result that he was virtually blind. Vision of the better (right) eye was 3/60. In February, 1952, he was admitted to Moorfields Hospital, where his eye condition was thought at first to be due to tuberculous iridocyclitis. He was found, however, to have enlarged lymph-nodes. Radiography revealed large hilar glands and reticulation of both lung fields. Mantoux 1/100 negative. He was therefore thought to have sarcoidosis.

Lymph-node biopsy in July, 1952, at St. Mary's Hospital, London (under Prof. G. Pickering) showed typical granulomatous changes of sarcoidosis. Renal function was impaired, blood-urea level 56 mg. per 100 ml., urea clearance 45%, and serum-calcium level 14 mg. per 100 ml. Treatment with low-calcium diet in December, 1952, lowered his serum-calcium level (fig. 3). His blood-urea level fell from about 58 to 38 mg. per 100 ml. He was transferred to University College Hospital in January, 1953, for further metabolic study. Both corneæ and scleræ showed granular opacities; that in the right eye covered the lower two-thirds and had a sharp upper margin. The left was somewhat similar. The fundi could not be seen. Enlarged lymph-nodes were palpable. Plasma-calcium level 11·5 mg. per 100 ml.; blood-urea level 40 mg. per 100 ml.; urea clearance 65% of normal.

Treatment with low-calcium diet for twelve days was followed by a slight fall of the plasma-calcium level from 12·6 to 12·2 mg. per 100 ml., but it rose later to over 13 mg. per 100 ml. when normal calcium intake was restored. Metabolic balance studies on a normal calcium intake before and after cortisone are shown in fig. 4. Plasma-calcium changes are shown in fig. 1, no. 9. The patient's eyesight did not improve on cortisone eye-drops given during the control period, but with the oral cortisone there was a great improvement in his vision, that of the right eye becoming 6/12 and the left 6/60 unaided. He was discharged on a maintenance dose of cortisone 50 mg. a day. While on cortisone he had two vitreous hæmorrhages in his right eye, but they cleared without the cortisone having to be discontinued, and he was active and well, with good vision and normal plasma-calcium and blood-urea levels, in May, 1954.

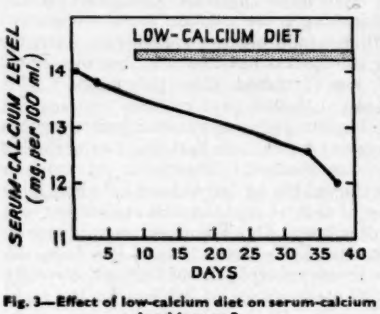

Fig. 3—Effect of low-calcium diet on serum-calcium level in case 2.

Case 3.—A married woman, aged 56, developed difficulty in walking, especially with the right leg, in 1947. Six months later she began to have repeated attacks of vomiting. In 1948 itchy red patches appeared on her back and thighs, and her eyes became red and sore. There were also generalised backache and stiffness of the limbs. In 1949 she was investigated at the National Hospital, Queen Square, where her serum-calcium level was found to be 14 mg. per 100 ml. and her blood-urea level 108 mg. per 100 ml.

She was advised to take vitamin D and milk, and after this her backache and stiffness increased. In 1950 she had an attack of herpes zoster, which cleared satisfactorily. She slowly became more breathless, lost weight, and had severe frequency of micturition. In view of her past history she was transferred to University College Hospital in October, 1950, as a possible case of hyperparathyroidism. She was found to have an urticarial rash, conjunctivitis, and calcification of the subepithelial layers of the cornea at the lateral margins of the limbus (band keratitis). Her plasma-calcium level was 13·1 mg. per 100 ml., blood-urea level 120 mg. per 100 ml. A calcium balance on a low-calcium diet was done (fig. 5). In view of the continuing high urinary calcium and plasma-calcium levels and of the general clinical picture, her neck was explored for a parathyroid tumour. Four normal-sized glands

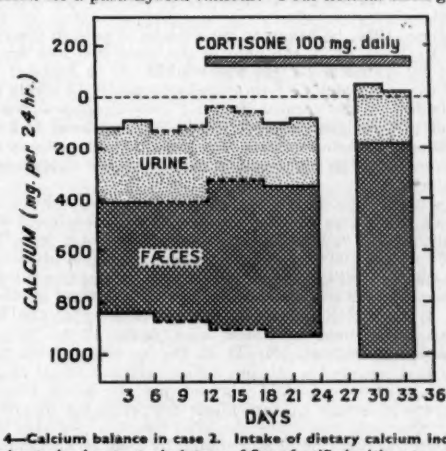

Fig. 4—Calcium balance in case 2. Intake of dietary calcium increased owing to inadvertent admixture of flour fortified with extra calcium (interrupted lines indicate possible error of ±40 mg. daily during this period).

were found, but biopsy of an enlarged lymph-node showed changes typical of sarcoidosis. On discharge her plasma-calcium level was 15 mg. per 100 ml. In retrospect it is clear that we belittled the significance of the abnormally low fæcal excretion of calcium during her balance determination.

For eighteen months she felt reasonably well, and then her rash became worse and more irritable, her backache became severe, and she lost a considerable amount of weight. She was readmitted in July, 1953. This time her rash showed as brownish coloured flat oval papules about 1 cm. in diameter. There was still a trace of protein in the urine. The blood-urea level was 162 mg. per 100 ml.; urea clearance 13% of normal; and plasma-calcium level 12·8 mg. per 100 ml. No acid-fast bacilli were found in the sputum; and a Mantoux test was 1/100 negative. Metabolic balance data before and during treatment with cortisone are shown in fig. 6. During treatment her plasma-clacium level fell to normal (fig. 1, no. 5), the rash disappeared, and there was much improvement in general health. This occurred in spite of an unfortunate brief episode of hyperkalæmia resulting from our having supplemented her diet with 3 g. of potassium chloride a day while on cortisone. The blood-urea level fell with treatment to 129 mg. per 100 ml., and her renal function, measured by urea-clearance and concentration-dilution tests, improved slightly. She was maintained on cortisone 37·5 mg. daily.

She felt very well for two months but then caught a severe cold. Since then her backache and the pains in her legs slowly returned. She was readmitted to hospital in February, 1954, having stopped her cortisone maintenance therapy two weeks before. Her plasma-calcium level was 12 mg. per 100 ml., and blood-urea level 132 mg. per 100 ml. Her plasma-calcium level fell with cortisone (150 mg. per 24 hr.) (fig. 1, no. 6), but her blood-urea level had risen to 191 mg. per 100 ml. She was maintained for two weeks on cortisone 75 mg. but this has now been reduced to 67·5 mg. In May, 1954, she remained well and almost symptom-free, her plasma calcium being normal.

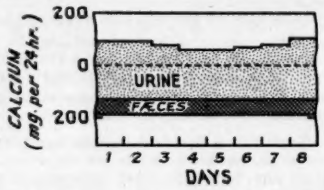

Fig. 5—Calcium balance in case 3 on low-calcium diet.

Case 4.—A man, aged 25, was admitted to University College Hospital in July, 1950, complaining of vague dyspeptic symptoms for three months, loss of 16 lb. weight, and nocturia. An enlarged lymph-node was found in the right axilla. Radiography showed bilateral enlargement of hilar glands with miliary mottling of both lung fields. Urine contained a few pus cells. No tubercle bacilli in the sputum. Intravenous pyelogram normal. Blood-urea level 60 mg. per 100 ml.; urea clearance 60% of normal. He was thought to have sarcoidosis. He was followed as an outpatient, and in January, 1951, his plasma-calcium level was 12·6 mg. per 100 ml.

In June, 1951, he began to get attacks of pain in the right loin. In April, 1952, the pain in the right loin was accompanied by hæmaturia. He was readmitted to hospital and found to have palpable lymph-nodes in the right axilla and calcification of the corneal limbus. Radiography showed a calculus in the right kidney. Plasma-calcium level 14·3 mg. per 100 ml.; blood-urea level 54 mg. per 100 ml. Biopsy of a lymph-node in the right axilla confirmed the diagnosis of sarcoidosis.

On a diet of about 900 mg. of calcium a day the urinary excretion of calcium was 350 mg. per 24 hr. Treatment with low-calcium diet lowered his plasma-calcium level from 13·6 to 12·2 mg. per 100 ml., and his urinary excretion of calcium after nine days fell to 190 mg. per 24 hr. He was treated with cortisone, and his plasma-calcium level fell further, as shown in fig. 1, no. 7. Radiography showed clearing of the lung shadows. His urea clearance rose from 47 to 75% of normal with treatment. Mr. D. R. Davies explored his right kidney and removed a calcium-oxalate stone. Renal biopsy revealed evidence of mild chronic pyelonephritis but no characteristic lesions of sarcoidosis nor evidence of calcification. Cortisone was withdrawn after twenty-three days (this admission was reported in more detail by Dent et al. 1953).

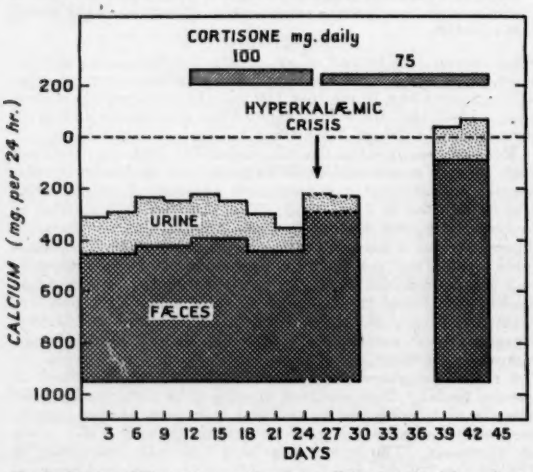

Fig. 6—Calcium balance in case 3 on normal intake of calcium (interrupted lines indicate minimal excretion of calcium in fæces because one stool was lost in this period).

In January, 1953, he was readmitted to hospital complaining of abdominal pain on his right side and mild urinary symptoms. Enlarged lymph-nodes were palpable in the axillæ and groins. Plasma-calcium level 15·2 mg. per 100 ml.; blood-urea level 36 mg. per 100 ml.; urea clearance 45%. Radiography of the chest revealed partial relapse to the former condition, and of the abdomen showed a small opacity over the lower pole of the right kidney. He was again treated with cortisone, and his plasma-calcium level returned to normal (fig. 1, no. 8). His chest radiograph cleared. He was discharged on a maintenance dose of cortisone 37·5 mg. a day, and in May, 1954, was well, with normal plasma-calcium levels.

Discussion

All these four patients had the clinical manifestations of hypercalcæmia: fatigue, weakness, anorexia, nausea, vomiting, and loss of weight. They also had polyuria, proteinuria, and renal failure; and three of them had the corneal changes of band keratitis. Various theories have been proposed to explain occasional hypercalcæmia in sarcoidosis. It has been suggested that it is related to a disturbance in plasma-proteins and the binding of calcium by protein; that it is a manifestation of parathyroid overactivity; and that it results from active destruction of bone by sarcoid deposits. However, in normal circumstances, plasma-albumin has a much greater binding power for calcium than has globulin (Gutman and Gutman 1937), and any increase in the globulin fraction, such as is often found in sarcoidosis, is unlikely to raise the total plasma-calcium level appreciably. Moreover, if the amount of calcium is protein-bound, it is difficult to explain the hypercalcuria (Schupbach and Wernly 1943) and the symptoms of hypercalcæmia. Parathyroid hyperplasia has been reported in some cases of sarcoidosis with hypercalcæmia (Westra and Visser 1949, Longcope and Freiman 1952), but in others surgical exploration has shown the glands to be normal (Albright and Reifenstein 1948). Our case 3 was thought at first to have a parathyroid tumour, but exploration of the neck revealed that the four glands were of normal size. No case has been reported with a low serum-inorganic phosphorus level. This is strong evidence against parathyroid overactivity. Dent et al. (1953) favoured the theory that destruction of bone by sarcoid deposits might cause the hypercalcæmia, their conclusion being mainly based on the rapid response to cortisone therapy. This response has been fully confirmed in the more extensive data reported here. In the presence of more advanced renal failure a further contributory factor might be an inability to excrete calcium as fast as it is being liberated from bone.

Study of the calcium-balance data revealed that in all three patients the fæcal excretion of calcium was less than normal. Usually about 85–90% of the dietary intake of calcium is recovered in the fæces. However, in case 1 the fæcal excretion of calcium was 75% of the intake, in case 2 it was 73%, and in case 3 on two successive occasions it was 33% and 52%. These balances were mostly done while the patient was on a standard ward diet of about 800 mg. of calcium supplemented by 10 μg. of calciferol a day. We must therefore conclude that the patients were absorbing more calcium from the gastro-intestinal tract than would healthy controls on a similar diet. The other theoretical possibility is that less endogenous calcium was excreted into the fæces. This excretion is usually believed to be about 100 mg. of calcium a day. Its complete suppression was therefore not enough to account for the smallest fæcal excretion of calcium noted. An increased absorption of calcium could be due to the taking of large doses of vitamin D or, in the absence of this, to an increased sensitivity to a normal amount of vitamin D. The close resemblance in our patients to a vitamin-D action is seen also from the abnormally large urinary excretions of calcium, strongly suggesting that the reabsorption of calcium by the renal tubules was decreased. Much evidence has been pub-

lished that vitamin D has this action on the renal tubule (Dent 1954a).

The possibility of sensitivity to vitamin D in some cases of sarcoidosis is further suggested by a consideration of the known data regarding the tolerance of healthy people and of patients with sarcoidosis to large doses of vitamin D. Many people tolerate fairly large doses of vitamin D. Steck et al. (1937) reported that, of 773 patients, most of whom had arthritis, who received more than 100,000 units of vitamin D daily for considerable periods of time, only 64 developed toxic reactions. Steinberg (1938) reports 40 cases of chronic arthritis treated from several weeks to $1^1/_2$ years with 160,000 units of vitamin D daily; there were no hypercalcæmic complications, and he thought that the toxicity of vitamin D had been over-emphasised. Many patients with skin tuberculosis have been treated for considerable periods of time on similar doses of vitamin D with few untoward results (Anning et al. 1948).

In striking contrast to this, many patients with sarcoidosis are abnormally sensitive to vitamin D. Scadding (1950) has described several patients who were very intolerant of any therapeutic dose of vitamin D. Curtis et al. (1947), Robertson (1948), and Nelson (1949) have shown that many patients with sarcoidosis do not tolerate large doses of vitamin D and, when such treatment is given, rapidly develop hypercalcæmia. Harrell and Fisher (1939), who first drew attention to the hypercalcæmic syndrome in sarcoidosis, reported a rise in serum-calcium level in one case from 9·6 to 14·2 mg. per 100 ml. on taking a pint of cod-liver oil monthly.

Our case 1 was very sensitive to vitamin D, for his serum-calcium level rose rapidly to 16·3 mg. per 100 ml. on 9000 units of vitamin D a day. The response to a similar dose of vitamin D was tested on the same patient three years later after several courses of cortisone, and the plasma-calcium level rose from 10·3 to 11·3 mg. per 100 ml. in twelve days. There is a suggestion here that his sensitivity was declining. This change coincided with a lessening over the years of the clinical severity of his disease.

If increased absorption of calcium from the gut, as distinct from liberation of calcium from bone, is the main cause of the hypercalcæmia in sarcoidosis, treatment with low-calcium diet should relieve the hypercalcæmia by decreasing the quantity of calcium absorbed. Case 2 responded on two occasions when given low-calcium diet of about 200 mg. a day. On the first occasion (fig. 3) the fall was clear-cut after forty days; on the second occasion it fell 0·4 mg. per 100 ml. after only twelve days. In case 4 it also fell convincingly on one occasion (fig. 1, no. 7), which was unfortunately the period before he was given the cortisone.

It was particularly to study the action of cortisone on our patients that we undertook calcium-balance studies before and during treatment. It will be seen from figs. 2, 4, and 6 that the cortisone increased the fæcal calcium. Our other data showed that, as the fæcal calcium has increased, the plasma-calcium levels have fallen and, more slowly, the urinary calcium has decreased. The urinary calcium continued to decrease after normal plasma-calcium levels had been reached, as if reabsorption by the kidney tubules was continuing to increase.

The cortisone thus reversed the metabolic defect and appeared to exert an action directly antagonistic to that of the vitamin D, to which the patients appeared abnormally sensitive. Should this antagonistic action occur as a more general phenomenon, patients with Cushing's disease should absorb very little calcium from the gastro-intestinal tract. This appears to be so. Freyberg and Grant (1936) and Soffer et al. (1950) report balance data which show that the absorption of calcium from the bowel in such cases is very low. The patients of Freyberg and Grant (1936) were given large doses of vitamin D, but it did not increase the absorption of calcium from the gastro-intestinal tract. The poor absorption of calcium was also observed when high-calcium diets were taken.

To this evidence we can add further published data which also suggest that administered cortisone increases the requirement of vitamin D. Moehlig and Steinbach (1954) report that hypoparathyroid patients, already well controlled on tachysterol, when treated with cortisone for multiple osteo-arthritis developed tetany in spite of large oral doses of calcium and of tachysterol. They also report a patient with sprue who developed tetany when given cortisone. This was not completely relieved by oral and intravenous calcium; when the cortisone was stopped, the tetany was well controlled with calcium and vitamin D. Colcher et al. (1953) also report overt tetany in three cases treated with cortisone and corticotrophin for intractable sprue.

It is conceivable that cortisone and vitamin D act antagonistically by virtue of a substrate competition mechanism. The general resemblance between their molecular structures favours this possibility. Our data, however, neither support nor deny this; which, if true, would be unique in the steroid field and would justify the speculation that vitamin D in large doses might antagonise the action of cortisone—a situation with many clinical possibilities.

We suggest more seriously that cortisone would be worth a trial as treatment in cases of vitamin-D poisoning and in other conditions in which overabsorption of calcium plays a part. Especially would this apply to those cases now being described by pædiatricians as "idiopathic hypercalcæmia of infancy with failure to thrive" (Lightwood 1952), because we have unpublished data indicating that excessive calcium is absorbed in these cases. Cortisone may also be of value in the differential diagnosis of hypercalcæmia due to hyperparathyroidism and that due to sarcoidosis (as already suggested by Dent et al. 1953). We have treated one case of hyperparathyroidism with cortisone 150 mg. a day for ten days; there was no change in his plasma-calcium levels in this time, in striking contrast to our findings in sarcoidosis (fig. 1).

The problem how an abnormality of calcium metabolism comes to be associated, for no obvious reason, with a chronic granulomatous condition deserves consideration. Most cases of sarcoidosis are not associated with this abnormality, and we have discovered no clinical difference between the cases which do, and those which do not, have it. An important feature is that the action of cortisone on the calcium abnormalities coincides roughly in time with its action on the other manifestations of sarcoidosis. This suggests a close link between them. Could it be that the calcium defect results from the action of a sarcoid granuloma at some critical locality in the body? Such a situation operates in some of the other known protean manifestations of sarcoidosis.

A brief reference to some of this work was made during a discussion at the Royal Society of Medicine (Dent 1954b). Henneman et al. (1954) point out the close resemblance between the defect in calcium metabolism in sarcoidosis and the action of vitamin D.

Summary

Cortisone treatment lowered plasma-calcium levels to normal and improved renal function in four cases of sarcoidosis complicated by hypercalcæmia.

Calcium balances were studied in three of the patients before and after cortisone. Before treatment the fæcal excretion of calcium was less than normal; but, when cortisone was given, it increased to normal or more than normal.

It was concluded that the hypercalcæmia was mainly the result of overabsorption of calcium from the gut. Excessive erosion of bone from sarcoid deposits was

probably also contributory. Both these factors were presumably inhibited by cortisone.

Possibly the disorder of calcium metabolism in these cases was due to abnormal sensitivity to vitamin D. Cortisone may therefore have an action antagonistic to that of vitamin D.

The response to cortisone may help to distinguish the hypercalcæmia of sarcoidosis from that of hyperparathyroidism.

Cortisone should be tried in other states of increased absorption of calcium—e.g., vitamin-D poisoning and idiopathic hypercalcæmia of infancy.

We wish to thank Prof. G. M. Bull and Prof. G. Pickering for referring cases to us; Sisters C. Turner and K. Buck for supervising the nursing, Miss D. Tuck and Miss B. Redgwick for preparing and controlling the diets, and Mr. V. K. Asta for the charts.

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TREATMENT OF EARLY WHOOPING-COUGH WITH CHLORAMPHENICOL PALMITATE*

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THE Medical Research Council (1953) indicated that chloramphenicol was of some value in the treatment of whooping-cough in the first week of illness but not in the later stages. The present investigation was made to determine if better results could be obtained by treating children as soon as the earliest symptoms of whooping-cough were noted.

Plan of Investigation

Children aged 0–4 years who were home contacts of known cases of whooping-cough were included in the trial provided they were in the early stages of the illness, had not previously had whooping-cough, and had not been immunised against it. To get cases as early as possible arrangements were made for contacts to attend a special hospital outpatient contact clinic, held thrice a week, as soon as the first case in a family was diagnosed. Each general practitioner with patients in the area served by the hospital concerned was informed of the scheme by letter and by personal telephone conversation with one of us (D. M.). Printed cards with instructions about the hospital clinic were sent to each practitioner for issue to suitable patients. The medical officers of health in the three London boroughs in which the investigation was made coöperated by making the scheme known to their health visitors and sanitary inspectors and by sending copies of all notifications of whooping-cough to the hospital. To facilitate attendance at the contact clinics parents were allowed to bring all the children in the family, even if they were already in a late stage of whooping-cough; such late cases were given advice and treatment but were not included in the trial.

Children admitted to the trial were divided by sex and placed in one of three age-groups—0–11 months, 12–35 months, and 36–59 months—and were allocated by the random sampling method to a treated or a control group. Children in both groups were given suspensions, of the same appearance and taste, to be taken twice daily for 7 days. In the treated group the amount of chloramphenicol palmitate differed for the three age-groups. Children aged 0–11 months were given the equivalent of 1·0 g. of chloramphenicol daily, children aged 12–35 months 1·5 g. daily, and children aged 36–59 months 2·0 g. daily. The suspension for the control group contained no chloramphenicol. Each child was observed for 28 days from the first day of treatment, during which time the parent kept a careful daily count of the number of paroxysms and noted if they were mild, moderate, or severe. A nurse-investigator visited the patient at home at least once a week to check the mother's records, and in addition the child was brought to the contact clinic once a week, where the records were again checked and clinical observations made. The mother, the nurse-investigator, and the pædiatrician who made the clinical notes did not know to which group a child belonged until the end of the study. Pernasal swabs for the isolation of *Hæmophilus pertussis* were taken on the day before the start of treatment and at intervals afterwards.

TABLE I—NUMBER OF DAYS FROM ONSET OF SYMPTOMS TO BEGINNING OF TREATMENT

—	No. of days						
	1–	2–	4–	6–	8–	10–	12–14
Control group ..	0	3	11	2	8	1	2
Treated group ..	1	4	8	4	6	0	0

Number of Cases

During the investigation 55 children were taken into the study—27 in the control group and 28 in the treated group. 5 children, all in the treated group, were subsequently excluded: 2 were intolerant of the drug and vomited each time it was administered, 2 mothers were uncoöperative, and 1 mother did not record the number of paroxysms, but she said the child had a very mild attack. The age and sex distribution of the 50 children whose records were fully analysed were as follows:

	Controls			*Treated*		
Age	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*
0–11 mos.	2	5	7	4	3	7
12–35 mos.	6	5	11	5	4	9
36–59 mos.	6	3	9	5	2	7

We could not obtain children for treatment as early in the disease as we had hoped. The average interval between onset and treatment was 6 days in the control

* A report to the whooping-cough treatment working party of the Medical Research Council.

TABLE II—AVERAGE NUMBER OF PAROXYSMS PER CASE PER DAY

Day of observation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Control group ..	8·9	9·7	10·3	11·4	10·7	9·2	9·8	9·8	8·5	8·9	8·8	8·8	8·5	7·9	7·8	7·6	6·6	6·4	5·8	5·4	5·3	4·7	5·0	4·2	3·7	3·0	2·6	2·2
Treated group ..	10·1	8·7	8·7	9·3	7·0	6·8	5·8	6·4	5·7	4·4	4·3	4·3	3·9	3·9	4·0	4·0	3·5	3·8	3·8	3·4	3·9	3·8	3·8	3·2	3·3	3·2	3·5	2·1
Difference *	−1·2	1·0	1·6	2·1	3·7	2·4	4·0	3·4	2·8	4·5	4·5	4·5	4·6	4·0	3·8	3·6	3·1	2·6	2·0	2·0	1·4	0·9	1·2	1·0	0·4	−0·2	−0·9	0·1

* Difference = no. of paroxysms in control group minus number of paroxysms in treated group.

group and 5 days in the treated group (table I). 3 of the patients in the control group had symptoms for 10–14 days before the beginning of treatment. These 3 patients had less than the average daily number of paroxysms for the control group as a whole. Their inclusion did not therefore bias the results in favour of the treated group.

The results were assessed by analysing the number and severity of the paroxysms in the two groups. 3 complicated cases (2 in the control and 1 in the treated group) were admitted to hospital between the 4th and 7th days after the beginning of treatment and could not be observed further; the number and severity of paroxysms were noted until they were admitted, but not afterwards.

Number of Paroxysms

The average number of paroxysms per case per day is given in table II and in the accompanying figure. There were consistently fewer paroxysms in the treated than in the control group, and though the numbers were small, the results resembled those reported by the Medical Research Council (1953).

A frequency distribution of the percentage of cases with defined numbers of paroxysms on certain days after the beginning of treatment is given in table III, and this method of analysis confirmed the results obtained by the method shown in table II.

Severity of Paroxysms

The severity of the paroxysms was, as has been mentioned, assessed by the nurse-investigator and the mother. They recorded each day whether they considered the paroxysms to have been absent, mild, moderate, or severe. The result of the analysis of this information is given by 4-day periods in table IV. From about the 9th to the 20th day the proportion of children with no paroxysms or mild paroxysms was considerably greater in the treated group than in the control group. Before and after this period the differences were small. Severe paroxysms were less frequently noted in the treated group at all intervals except in the last (25–28 days), when none of the paroxysms in either group were considered severe.

TABLE III—PERCENTAGE OF CASES WITH 0–9, 10–19, AND 20 OR MORE PAROXYSMS ON 2ND, 6TH, 10TH, 14TH, 18TH, 22ND, AND 26TH DAYS OF OBSERVATION

No. of paroxysms	Day 2		Day 6		Day 10		Day 14		Day 18		Day 22		Day 26	
	C %	T %	C %	T %	C %	T %	C %	T %	C %	T %	C %	T %	C %	T %
0–	70	52	58	74	64	86	72	91	72	95	92	96	100	96
10–	15	44	35	17	28	13	16	9	28	5	8	5	0	5
20+	14	4	8	9	8	0	12	0	0	0	0	0	0	0
No. of children	27	23	26	23	25	22	25	22	25	22	25	22	25	22

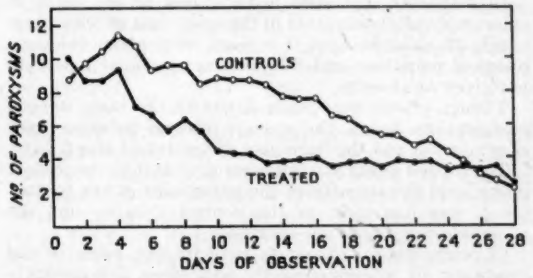
C, controls. T, treated.

Complicated Cases

Complicated cases were defined as those which developed any complication which the physician considered should be treated with specific antibiotics or with sulphonamides. 3 such cases occurred during the study —2 in the control and 1 in the treated group. In all 3 bronchopneumonia was diagnosed between the 4th and 7th days of treatment in children who had symptoms for 4–6 days before the treatment began. These children were admitted to the hospital and lost to observation from the date of admission.

Bacteriological Results

The patients were swabbed before being taken into the study and at intervals afterwards. The swab results were not entirely satisfactory. In the treated group only 7 children and in the control group only 12 yielded swabs positive for *H. pertussis* before treatment began. Between the 3rd and 7th days of treatment 11 of 48 swabs from the control group and 1 of 44 swabs from the treated group were positive. Between the 8th and 14th days 5 of 49 swabs from the control group and 2 of 37 swabs from the treated group were positive. On the figures available, therefore, it appeared that it was more difficult to isolate *H. pertussis* from the treated than from the control group between the 3rd and 7th days of treatment.



Daily numbers of paroxysms in children treated with chloramphenicol palmitate and in controls.

Discussion

Whooping-cough is still common and serious, particularly in young children; 45% of the 394 deaths from pertussis in England and Wales in 1950 were in children aged less than 6 months. Though effective, immunisation is still mainly limited to children aged more than 6 months. We wished to ascertain if whooping-cough diagnosed in the very earliest stages could be aborted by antibiotic treatment as suggested by the findings of the Medical Research Council (1953) and by Bogdan (1951). Though the number of cases studied was small owing to the

TABLE IV—PERCENTAGE OF CASES WHERE PAROXYSMS WERE DESCRIBED AS ABSENT OR MILD, MODERATE, OR SEVERE (IN 4-DAY PERIODS)

Paroxysms	Days 1–4		Days 5–8		Days 9–12		Days 13–16		Days 17–20		Days 21–24		Days 25–28	
	C %	T %	C %	T %	C %	T %	C %	T %	C %	T %	C %	T %	C %	T %
Absent or mild ..	51	41	34	40	33	69	39	79	53	81	80	87	88	90
Moderate ..	34	50	45	50	50	31	49	21	38	19	16	13	12	10
Severe ..	15	9	21	10	17	0	12	0	9	0	4	0	0	0

C, controls. T, treated.

absence of an epidemic at the time of investigation and also probably owing to increasing numbers of immunised children in the area, the trial showed that chloramphenicol palmitate reduced the frequency and severity of paroxysms of early treated patients but did not abort the whooping-cough. In spite of our efforts to obtain cases in the earliest stages, the average interval from the onset of the illness to the beginning of treatment was 6 days. It seems to us that general practitioners are unlikely to get cases earlier than we succeeded in doing in this investigation, and the results we obtained probably indicate the best that can be expected from the use of chloramphenicol palmitate, in the doses we used, in the treatment of pertussis. It is clear that chloramphenicol has a limited application in treatment. Though there was no evidence of untoward sequelæ in the patients we treated, chloramphenicol treatment is not free from risk (Hodgkinson 1954) and should not be used except in special circumstances.

Summary

In a strictly controlled investigation of the value of chloramphenicol palmitate in the treatment of whooping-cough 23 children aged 0–4 years were given chloramphenicol palmitate and 27 children of similar age were not given antibiotics.

Though efforts were made to obtain the cases as soon as symptoms began, the average interval between onset of symptoms and the beginning of treatment was 6 days.

The treated group had fewer paroxysms than the control group, and the severity of the paroxysms in the treated group was less than in the control group; but the whooping-cough was not aborted.

Chloramphenicol palmitate is of limited value in the treatment of whooping-cough and, since it sometimes causes untoward sequelæ, it is not wise to use it as a routine.

We are grateful to the research committee of the Queen Elizabeth Hospital for Children, and to Prof. R. Cruickshank and Prof. A. Bradford Hill for help and advice in this investigation, and to the general practitioners and medical officers of health of Bethnal Green, Hackney, and Shoreditch for their coöperation in arranging for suitable cases to attend the whooping-cough outpatient clinic. Messrs. Parke, Davis & Co. supplied the chloramphenicol palmitate and prepared the suspension given to the children in the control group.

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RAUWOLFIA SERPENTINA IN THE TREATMENT OF HIGH BLOOD-PRESSURE

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Rauwolfia serpentina, although mentioned in ancient Hindu texts of 1000 B.C. and A.D. 200 under its Sanskrit name *sarpagandha* (Trease and Evans 1954) and freely used in India for more than six hundred years for various medicinal and antidotal purposes, has been internationally recognised and studied for only five years.

Chopra et al. (1933) were the first to observe the hypotensive properties of the root of *R. serpentina* in experiments on animals. So far as can be ascertained, I was the first to report on its therapeutic value as a hypotensive agent in man (Vakil 1940). Two years later its hypotensive action was clinically investigated in hypertensive patients by Bhatia (1942).

In spite of numerous clinical and pharmacological studies in India, in 1942–48 no interest in *R. serpentina* was aroused in other countries until its beneficial effects in 50 cases of essential hypertension were described in England (for the first time outside India) by Vakil (1949). Since then more than a hundred papers on the subject have been published in various countries. Among the most notable of these are those of Wilkins and Judson (1953) and Ford et al (1953) in U.S.A.; Joiner and Kauntze (1954) in England; Vida (1952) and Arnold and Bock (1953) in Germany; and Löffler et al. (1953) in Switzerland.

In India *R. serpentina* has been applied with such vigour during the last two decades to the treatment of hypertensive states that, according to Vakil (1949) more than 90% (about 60,000) of doctors there use it daily as a routine hypotensive agent, and more than 100,000,000 tablets have been sold there in the last fifteen years.

In view of such unprecedented popularity for years in India, and the favourable reception accorded to it within recent years in the U.S.A., Germany, Switzerland, and other countries, a fresh appraisal of its clinical value in hypertension appears necessary.

Since 1938 I have observed the effects of *R. serpentina*, both in hospital and in private practice, in about 20,000 cases of high blood-pressure of diverse types and degrees of severity. Although detailed investigations and follow-up studies were possible in only some of these cases (previously reported), considerable information of practical value has been collected during these years, and is summarised briefly here.

Indications

All cases of hypertension—essential, renal, endocrine, and secondary—irrespective of age and sex and of whether they are associated or not with cardiovascular, renal, and other complications, are suitable for treatment with *R. serpentina*. Of all the known hypotensive remedies *R. serpentina* exhibits the widest range of applicability, being found useful in virtually every case of hypertension. I have tried it in every form of hypertension, including acute and chronic nephritis, malignant hypertension, hyperthyroidism, Cushing's syndrome, and suprarenal tumour, and in practically all age-groups, including children.

Although ideally suited for the milder degrees of hypertension *R. serpentina* has proved useful even in the severest cases when prescribed in conjunction with other hypotensive agents—e.g., hexamethonium, *Veratrum viride*, and hydrazinophthalazine.

Contra-indications

Although there are no definite contra-indications to the use of *R. serpentina*, in view of its stimulant effect on the smooth muscles of the intestines it is better avoided during bouts of diarrhœa or dysentery. Also in acute cardiovascular emergencies—e.g., coronary thrombosis, cerebral thrombosis, and severe congestive cardiac failure—where any further lowering of blood-pressure is likely to worsen the patient's condition, it is better not to use *R. serpentina*. In rare cases there is hypersensitivity to *R. serpentina*, even small doses provoking adverse reactions—e.g., a precipitate fall of blood-pressure, circulatory collapse, extreme restlessness, and severe allergic reactions, such as urticaria and bronchial spasm (observed recently in 2 of my cases).

Administration and Dosage

Treatment with *R. serpentina*, being effective orally, non-toxic, and inexpensive, can easily be given even to ambulant outpatients since it requires neither laboratory facilities nor close supervision.

Since no fixed schedule of dosage is applicable to all cases of hypertension, the optimal dose has to be determined for each case. However, in about two-thirds of my cases of essential benign hypertension an average dose of crude extract, equivalent to 4 mg. of total

alkaloids and 0·25–0·35 mg. of reserpine, given thrice daily lowered the systolic and diastolic pressures satisfactorily. In about half the cases which proved refractory to such doses larger or massive doses of reserpine produced satisfactory results. In the *R. serpentina* hyperreactors, who account for only a small percentage of cases, even minute doses—e.g., 2 mg. of total alkaloids, and 0·2 mg. of reserpine—can cause a brisk fall of blood-pressure. In my experience, whereas smaller doses have sufficed in climacteric, psychogenic, and labile forms of hypertension, even massive doses have failed in malignant and renal hypertension. In some cases of renal type doses four or five times the average therapeutic dose may prove completely incapable of altering the blood-pressure levels.

Results

Hypotensive Response

A hypotensive response, both systolic and diastolic, is observed to a varied extent in more than two-thirds of all hypertensives treated with *R. serpentina*.

In my cases of uncomplicated benign essential hypertension both systolic and diastolic pressures were lowered in 70–80% of cases after a month's treatment either with the crude extract of *R. serpentina* or with the isolated alkaloid reserpine.

About 1 case in 5 of essential hypertension is completely refractory to *R. serpentina* (the so-called "R.S. non-reactors").

Although in most cases *R. serpentina* lowers both systolic and diastolic pressures gently and gradually, 1 case in 5 responds to it with a sudden or sharp drop of pressure or "spiking" (the so-called "R.S. hyperreactors"); such a response may be either immediate or delayed.

In most cases the hypotensive response takes about 2–6 days to appear and disappears slowly in 1–5 weeks. This drop of pressure is independent of age, somewhat better in females than males, and far better in the labile forms of hypertension.

Persistence of Action

The hypotensive action of *R. serpentina* can often be shown 2–4 weeks after the end of therapy. In benign essential hypertension the hypotensive effects of *R. serpentina* and of reserpine were demonstrable 2 weeks after withdrawal in about 80% of cases.

Consistency of Action

A hypotensive action is demonstrable over and over again in the same patient on the resumption of treatment with reserpine after its withdrawal (Vakil 1949, 1953).

Predictability of Action

In view of the fact that the hypotensive action and clinical response to *R. serpentina* usually follow the same pattern in any given person, their nature and extent are often predictable before the resumption of therapy.

Withdrawal symptoms seldom develop with *R. serpentina*, even when treatment is suddenly interrupted or stopped. Even the cessation of massive doses of crude extract or of the alkaloid of *R. serpentina*, in hypertension of diverse types and degrees, led to no more than temporary inconvenience.

Habit formation is apparently not a feature of *R. serpentina* therapy, since craving is not displayed by patients for the drug even when it is withdrawn after long periods of administration.

Relative Merits of Different Preparations

Comparative studies on crude extracts, total alkaloids, and individual alkaloids—e.g., reserpine—of *R. serpentina*, in my series of cases, have not substantiated the alleged superiority of one form of preparation over another. The results obtained with the different preparations from the points of view of clinical response, hypotensive action, and side-effects, have been practically identical.

Subjective improvement is noted by most of the hypertensive patients treated with *R. serpentina*. Apart from an amelioration of hypertensive symptoms—e.g., headache, vertigo, tinnitus, precordial ache, and palpitation—a characteristic sense of tranquillity or well-being is induced. It has been shown by a so-called "double-blind" test that this improvement is real and not psychogenic. It is particularly noticeable in the climacteric, psychogenic, and labile forms of hypertension. On the other hand, clinical results are often disappointing in malignant, nephrosclerotic, nephritic, and arteriosclerotic forms of hypertension.

Objective findings—e.g., kidney-function tests, liver-function tests, electrocardiograms, teleradiograms, and fundoscopic findings—usually remain unaffected under treatment with *R. serpentina*. However, a few cases, after long treatment, may show minor alterations of one or more of these function tests, either for better or for worse.

Side-effects or reactions are occasionally observed during treatment with *R. serpentina* but are mild and may take the form of lassitude, drowsiness, diarrhœa, nasal obstruction, bradycardia, nausea, vertigo, or vomiting. Although circulatory collapse, fainting fits, nightmares, and restlessness, reported by other workers have been conspicuous by their absence in my cases, severe bronchial spasm of allergic type and urticaria were observed recently in 2.

Tolerance

In view of the wide margin of safety between the therapeutic and toxic doses of *R. serpentina* even large doses are usually well tolerated. I have often doubled or redoubled the dosage in refractory cases without serious consequences. The accidental ingestion of ten times the usual therapeutic dose by one of my patients led to no more than temporary weakness and giddiness.

So far as can be ascertained, not a single death has been reported anywhere from the therapeutic use of *R. serpentina*.

Additive or Synergistic Action

This is usually demonstrable when *R. serpentina* is used in conjunction with other hypotensive agents—e.g., hexamethonium, hydrazinophthalazine, and *Veratrum viride*. In these circumstances the blood-pressure can be lowered sufficiently even on suboptimal doses of these drugs and with few or no toxic effects or reactions.

Useful Combinations

Besides potent hypotensive agents like hexamethonium, *Veratrum viride*, and hydrazinophthalazine, other preparations of symptomatic or proved therapeutic value have been advantageously used conjointly with *R. serpentina* in hypertension—e.g., vitamin preparations (particularly vitamins B, C, and nicotinic acid), sedatives (phenobarbitone, bromides, and methylphenobarbitone), diuretics, and coronary dilators (aminophylline, theobromine, &c.).

Summary and Conclusions

On the basis of a fairly extensive trial of *R. serpentina* preparations in high blood-pressure during about sixteen years, various aspects of *R. serpentina* therapy are considered and discussed.

R. serpentina may be regarded as mild, non-toxic, inexpensive, easy to administer, and of proved value in high blood-pressure.

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PRESSURE PERFORATION AND RUPTURE OF THE ŒSOPHAGUS

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"Relatively little has been written on this subject, and even now many physicians are unaware of its existence. Articles and textbooks reviewing the differential diagnosis of acute surgical emergencies often fail to mention rupture of the œsophagus. The condition probably occurs more often than is suspected and should therefore be the subject of continued scrutiny."—Robert L. Anderson, speaker by invitation at the Thirty-Second Annual Meeting of the American Association for Thoracic Surgery, 1952.

AT the time of Barrett's (1946) comprehensive review, the number of cases of what was termed spontaneous perforation of the œsophagus was just short of 60. The record began with the fascinating story of the death of the Grand Admiral of Holland, Baron van Wassenaer, written in 1724 by the renowned Dutch physician Boerhaave.

The report of the first case to be diagnosed and treated successfully by surgery was published by Barrett (1947) and was closely followed by a similar report from Olsen and Clagett (1947) at the Mayo Clinic. Graham (1953) states that Mackler's (1952) 3 cases bring the total of published cases to 75, with only 13 survivals, but Priviteri and Gay (1951) traced 92 cases, and at the meeting of the American Association for Thoracic Surgery in 1952 42 more were added, bringing the total to 134, with 27 survivals. I have traced more than 200 published cases, including those reviewed by Barrett.

Most of the accounts of isolated cases emphasise the suggestion that rupture of the œsophagus is by no means so uncommon as was formerly supposed, and Barrett (1946) comments that "many spontaneous perforations must, in the past, have been missed altogether, even though a post-mortem examination may have been made."

The recent occurrence of an unusual case at this hospital stimulated the discovery of 3 more unreported cases in which the diagnosis was confirmed by necropsy. Three of these are described below, but in the 4th case (personally communicated by S. J. Hinds) the details are not available.

History

Spontaneous rupture of the œsophagus has also been comprehensively discussed by Samson (1951), Priviteri and Gay (1951), and Mackler (1952) in the United States and Russell (1953) in this country. Samson submits that the term "spontaneous perforation" of the œsophagus is a misnomer, and he uses instead the phrase "post-emetic rupture of the œsophagus." Other workers have used the term "spontaneous rupture of the œsophagus," but Alt et al. (1953) point out that this too is inaccurate, the word "spontaneous" being misleading. Reports have been published, however, of spontaneous perforations, within the literal meaning of the word spontaneous (occurring), at the site of an œsophageal ulcer or following neurosurgical operations or even without any apparent external cause; these seem to fall into a different category from the condition under discussion. It may well be that the confusion of names in the past has been one of the causes of the variations in the alleged number of published cases. In Mackler's (1952) total, for instance, many cases of "spontaneous perforation," including Barrett's first successful case, are not listed in his survey of "spontaneous rupture" cases, although it is clear that the terms are used synonymously. It is suggested therefore that the term "pressure rupture of the œsophagus" should be adopted because it gives a better indication of how the condition arises.

Ætiology

It is now generally agreed that sudden rupture of the œsophageal wall results from overwhelming distension of the œsophagus by pressure from an already overloaded stomach (fig. 1). It is thus most often associated with excessive eating or drinking and subsequent vomiting. It has been reported, however, as due to pressure transmitted during the lifting of a heavy weight, during straining in defæcation or in labour, or during an epileptic fit, or even to sudden direct pressure on the abdomen as the result of an accident.

Kinsella et al. (1948), Samson (1951), and Mackler (1952) have put forward explanations, supported by experiments on animals and bursting pressures in fresh human cadavers, of the ruptures and the failure of the œsophagus to relax in the normal manner. Intrinsic obstruction seems to be more commonly responsible, but extrinsic obstruction—e.g., a bolus of food lodged in the œsophagus—is also known. Weiss and Mallory (1929) suggested that repeated vomiting could interfere with the vomiting reflex, the vomiting centre becoming fatigued, with consequent loss of coördination, leading to failure of relaxation of the œsophagus. This might be the cause in some cases, especially the few which followed neurosurgery. Anderson (1952) points out that poor nutrition or a disturbance in protein metabolism may weaken the œsophageal wall and has been present in a significant number of cases.*

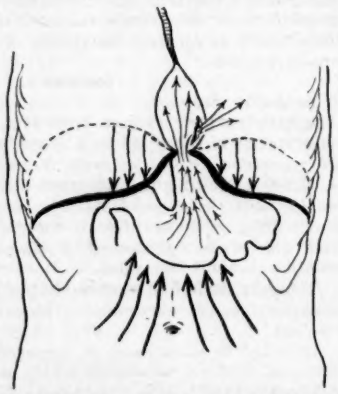

Fig. 1.—Forcible contraction of the abdominal muscles squeezes the stomach against a rigid diaphragm. The stomach contents are forced through the cardia into the œsophagus. Either an intrinsic or an extrinsic obstruction in the middle third of the œsophagus causes ballooning and rupture.

Incidence

Of the 200 cases traced, 87% have been in males. This may be due, as Barrett (1946) pointed out, to the fact that men are more likely than women to indulge in pursuits predisposing to violent vomiting. The patient's age has ranged from 5 months to 75 years, but most of the patients have been aged more than 40.

Pathology

Hitherto it has been considered that the rupture takes place in a normal œsophagus, but most workers have included cases in which either the œsophagus proved at necropsy to be abnormal or there was a suspicion that what Anderson (1952) calls asymptomatic œsophageal disease was present—e.g., in at least 3 of the 5 cases of Kinsella et al. (1948). In most cases the œsophagus has appeared normal, but this has not been invariably so.

Almost all the ruptures have taken place in the lower third of the œsophagus, usually just above the diaphragm and in the longitudinal axis of the œsophagus, varying in length from 2 to 6 cm., and situated on the left posterolateral wall. The rupture may penetrate either into the posterior mediastinum or, probably more rarely, directly into the pleural cavity. Rupture into the mediastinum sets up intense mediastinitis followed by widespread necrosis as the gastric juice digests the mediastinal tissues. Concomitant pleurisy develops with effusion of serous fluid into the pleural cavities. Eventually the gastric juice perforates the necrotic mediastinal contents

* Since this Article was written 2 cases have occurred of apparently terminal spontaneous perforations of the œsophagus in infants, both of which were associated with severe malnutrition.

and enters one, or possibly both, of the pleural spaces. With the original rupture gas also enters the mediastinum and tracks upwards into the neck, giving rise to surgical emphysema, usually in the later stages.

The contents of the pleural cavity may thus consist of food and often very large quantities of fluid, and may be heavily bloodstained owing to the rupture of blood-vessels in the œsophageal wall. Pus may form in the later stages, and a secondary tension pneumothorax may follow.

Clinical Picture

Classically, there is a history of repeated vomiting or of severe retching which terminates with a sudden excruciating pain, often of a tearing nature and situated in the upper part of the abdomen or the lower part of the chest. The agony is continuous, and the pain may radiate to the shoulder, up behind the sternum, or to the kidneys. Relief of vomiting almost invariably follows the rupture, but there is profound shock with initial pallor and low blood-pressure. The patient is anxious and restless, and morphine usually brings little relief of pain. The temperature is at first depressed, and the pulse is faint, thready, and rapid. There are dyspnœa and pain on breathing, but the respiration-rate is raised. The pallor gradually assumes an ashen-blue cyanotic tinge, the skin being cold and clammy and the forehead moist with perspiration. The temperature next rises, often to above 103°F, and the blood-pressure recovers somewhat, though rarely to the original resting level.

On examination there is often a striking difference between the upper and lower parts of the abdomen, the upper being rigidly board-like and the lower comparatively soft and not tender. Rigidity may be total, however, and there is usually acute tenderness in the epigastrium. Bowel sounds are rarely absent.

The clinical signs in the chest may appear normal at first, but with the initiation of pleural effusion crepitations will be found at one or both lung bases and will be followed by râles, absence of breath sounds, and a dull percussion note in the area of effusion. If the pleural cavity is perforated, the fluid level will usually be much higher, and there will be an audible succussion-splash. With the exacerbation of the chest signs the abdomen becomes less rigid, although the pain continues unabated. Thirst becomes severe; drinking water to relieve it merely adds to the volume of fluid in the chest. Displacement of the heart and mediastinum may be accentuated. A nasal twang often appears in the voice at this stage, and crepitus may become evident in the supraclavicular areas, over the upper part of the sternum, or in the neck.

Diagnosis

Eliason and Welty (1946) and other workers have emphasised that the classical features of rupture of the œsophagus are so typical that the diagnosis has more than once been made over the telephone, and it is therefore perhaps puzzling that more cases have not been diagnosed before death. Two main factors, however, militate against early diagnosis.

(1) Since successful treatment depends, with very few exceptions, on early diagnosis, it is general practitioners, casualty officers, and house-officers that should know of this condition. The general practitioner will undoubtedly recognise that some catastrophe has occurred, and he will request immediate admission to hospital. It may thus devolve on the house-surgeon, in the absence of a registrar, to recognise the condition; but for this he is singularly ill equipped because, with one or two notable exceptions, in the more widely used surgical textbooks in this country either there is no mention of it or it is mentioned merely to be dismissed as extremely rare, and it is seldom taught as a differential diagnosis in the teaching hospitals. Even if it is comparatively rare, its place in the differential diagnosis of alimentary disasters should obviously be reassessed in view of the survival-rate in diagnosed and treated cases of what is otherwise a fatal condition.

(2) Since the clinical picture overlaps in so many respects that of several common diseases, initial misdiagnosis is almost the rule in the absence of knowledge of the condition. The clinical picture which most closely simulates pressure rupture of the œsophagus is that of perforated peptic ulcer. Kinsella et al. (1948) cited 13 fruitless exploratory laparotomies based on this diagnosis. The cyanosis has led to the mistaken diagnosis of acute pancreatitis; other misdiagnoses include coronary thrombosis, dissecting aneurysm of the aorta, spontaneous pneumothorax, pulmonary embolism, and mesenteric thrombosis.

Investigations

Radiography may show mediastinal emphysema (which may still be subclinical), air overlying the heart shadow, or a fluid level in the chest. Though barium is often used to localise the tear, most workers are agreed that iodised oil should always be used for this purpose.

Treatment

There is now almost general agreement that prompt surgery offers almost the only chance of survival. It has been argued in the past that the desperate condition of most of these patients is a strong contra-indication to major surgery. This contention, however, has not been sustained in practice provided that time is on the surgeon's side. Several workers have drawn attention to the immediate improvement that follows the reduction of pressure in the pleural cavities and the removal of the corrosive contents. A left-sided thoracotomy under endotracheal anæsthesia, suture of the perforation with either silk or catgut, and drainage of the pleural cavity with an underwater seal have given the best results. It may be necessary to remove diseased tissue from the mediastinum. The patient should be fed through a stomach-tube for some days. Antibiotic therapy, both systemic and local, should be instituted immediately.

Prognosis

If left untreated the condition is almost certainly fatal, although a few patients have recovered without suture of the rupture (Nanson and Walker 1953). In several of these the pleural cavity was drained surgically, but others were not recognised until fistulas had developed, with subsequent recovery. Early operation is invariably successful; the hazards increase progressively with delay. Many factors influence the period of survival in untreated cases, and much depends on whether the rupture takes place into the mediastinum or into the pleural cavity.

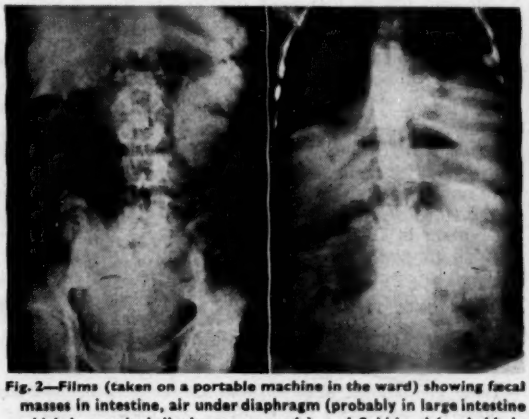

Fig. 2—Films (taken on a portable machine in the ward) showing faecal masses in intestine, air under diaphragm (probably in large intestine which has pushed diaphragm upwards), and fluid level (probably in stomach) in case I.

Case 3 (see below) survived for ten days without operation, but death usually takes place within three days.

Case-reports

Case 1.—A male vagrant, aged 57, was found collapsed in a common lodging-house and complaining of a sudden attack of severe pain in a vomiting bout. The pain was situated in the upper abdomen and radiated to the right chest and shoulder. His temperature was subnormal and his pulse-rate 120, pulse very thready, and the doctor who was called requested admission to hospital with a tentative diagnosis of perforated ulcer. The patient had told him that he had had a previous operation for the same cause. In fact, he had been admitted on three previous occasions, on each of which he had been found in a collapsed condition with severe abdominal pain. He had been found each time to be chronically constipated, and his bowels were evacuated with oil and enemas, though not without considerable difficulty. On the last admission there had been a history of nocturnal vomiting for three weeks, the vomitus being "coffee-coloured." After copious vomiting in the ward laparotomy had been done, but no abnormal findings were made apart from the constipation and possibly some evidence of a chronic duodenal ulcer. The patient also complained at that time of pain in the chest on swallowing, but investigations proved negative. His blood-pressure at this time was about 210/105 mm. Hg.

On admission he looked shrunken and ill. He said he had had increasingly severe indigestion with some constipation since his last discharge. He had vomited several times in the past eighteen hours, the fluid being brownish. His skin was cold and grey-blue. His temperature was 96°F, pulse-rate 130, and blood-pressure 105/80 mm. Hg. His chest and heart appeared normal. His abdomen was rigid and tender all over, especially the epigastrium. The abdomen was somewhat distended, and the rectum contained hard fæces. It was decided that he was again constipated but, since his condition was far worse than this single diagnosis warranted, he was thought also to have a perforated peptic ulcer. He was given an injection of 'Omnopon,' which did little to ease his pain. *Radiography showed masses of fæces in his abdomen and* apparently air below his raised left hemidiaphragm (fig. 2). A Ryle's tube was passed and brown fæcal material aspirated. 'Dextravan' was administered intravenously, but he went downhill rapidly and died in a few hours.

Necropsy Findings.—The whole of the intestine was full of fæces; the stomach contained fæcal fluid, which became more inspissated in the small intestine. From the middle of the jejunum downwards fæcaliths of various sizes were removed; in the large intestine some of these were as large as hen's eggs. One just above the anus measured 5 inches by 3 inches and was hard and dry. The intestine was thin and inflamed in many parts, but no frank peritonitis was found. No gastric or duodenal ulcer was discovered. The left lung was found completely collapsed, and there was at least a pint of fæcal fluid in the right pleural cavity. The heart was very small but otherwise normal. In the mediastinum was some fæcal material around the thoracic aorta and the lower part of the œsophagus and in the adjacent tissues. The œsophagus was clean and normal for three-quarters of its length from the upper end, but its lowermost quarter was filled with fæcal fluid and had a longitudinal perforation about 5 cm. long on the left posterolateral wall just above the diaphragm. Microscopical examination of the œsophagus showed no evidence of chronic inflammation or of abnormal gastric cell-rests.

Comment.—This case had many of the classical features of this syndrome, but the earlier history was misleading. The recurring constipation, the cause of the vomiting and consequent rupture, altered the abdominal clinical picture and the radiographic picture also. Three clinicians found nothing abnormal in the chest; this is difficult to explain in the light of the radiographs. Since there was no post-mortem evidence of intestinal perforation, it must be assumed that the air which showed under the diaphragm (fig. 2) was contained within the intestine. The fluid level was probably in the stomach. Death took place about twenty-four hours after the rupture.

Case 2.—A man, aged 42, was sent to hospital with the diagnosis of perforated peptic ulcer. He had had "indigestion" for years, and for the previous few weeks had vomited "watery fluid" every night. He had not vomited on the night before admission but had been awakened at 2 A.M. by sudden severe epigastric pain so agonising that he immediately summoned his doctor.

On examination in the ward three and a half hours later he looked mildly shocked, and his temperature was 98°F, pulse-rate 80, respirations 32 a minute, and blood-pressure 155/90 mm. Hg. His abdomen was rigid all over, especially the epigastrium. The lower part of the abdomen was only slightly tender but the upper part acutely so. Bowel sounds were absent. It was thought that the general practitioner's diagnosis was correct, but laparotomy by the senior house-surgeon at 6.30 A.M. revealed no abdominal lesion.

Five hours later the patient's condition appeared satisfactory, and he made no complaint of pain or of any abnormal symptoms. Radiography nine hours after the catastrophe revealed mediastinal emphysema with subcutaneous emphysema of the neck and chest wall.

Next morning the patient's condition was much the same, but the consultant surgeon and physician both thought he had a left spontaneous pneumothorax. That afternoon, at the thirty-ninth hour, the patient relapsed, and his blood-pressure dropped to 105/60 mm. Hg. This was thought to be due to a tension pneumothorax, and the chest was aspirated, air and foul pus being withdrawn. At this stage there was found to be surgical emphysema on the left side of the thorax and extending towards the neck. Rupture of the œsophagus was then diagnosed, and the pleural cavity was explored through the bed of the ninth rib at the forty-second hour after the rupture. The diagnosis was confirmed by the presence of intense widespread mediastinitis and of foul fluid and pus in the left pleural cavity. It was impossible to locate the perforation. An attempt was made to drain the pleural cavity, and antibiotic therapy was intensified, but the patient died fourteen hours later (fifty-six hours after the rupture).

Necropsy confirmed the diagnosis and showed an œsophagus apparently normal except for a rupture in the classical position on the left posterolateral wall just above the diaphragm.

Comment.—In this case it is not certain, although it appears probable, that the rupture took place in an attack of vomiting. The patient had not vomited before going to sleep as he had done for the previous three weeks, and this may be significant. On admission he did not have the severe shock usually associated with a pressure rupture, and his pain was not maintained at the usual agonising level. Nevertheless the clinical picture is quite clear in retrospect. The most common misdiagnosis was again made, and this case adds to the list of laparotomies for non-existent perforated ulcers. When this drew blank and the chest signs became clearer, the second common misdiagnosis of spontaneous pneumothorax was substituted. It was only in the later stage, when the surgical emphysema was clinically manifest, that the diagnosis became clear, and by that time it was too late.

Case 3.—A male paper-carrier, aged 32, was admitted to the Gravesend and North Kent Hospital in July, 1950, with his doctor's tentative diagnosis of either acute pleurisy or spontaneous rupture of the lung. The history showed that he had been healthy, with no digestive troubles and no lung disease or chronic cough. On the night before admission he had been to a Saturday party, where he had drunk at least seven pints of beer and a whisky. He had vomited and gone to bed. He was awakened at 1 A.M. by sudden severe pain in the chest, accompanied by difficulty in breathing and swelling of the face. The pain continued in intensity, and he sent for his doctor on the Sunday morning. He was seen shortly before noon, and at that time the pain was greatest in the right shoulder, there was hyper-resonance on percussion of the right chest, and surgical emphysema was present in the skin of the neck. Morphine was administered, and the patient was sent to hospital.

On examination shortly afterwards the patient was obviously distressed and in very poor condition. He was dyspnœic but not cyanosed, and complained of acute pain in the right chest posteriorly. His temperature was 99°F, pulse-rate 140, respirations 40 a minute, and blood-pressure 120/70 mm. Hg. There was surgical emphysema of the chest, neck, and face. It was thought that he probably had a left spontaneous pneumothorax, and the left chest was needled, but no air was

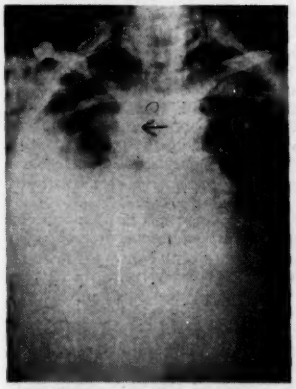

Fig. 3—Film taken about 12 hours after rupture in case 3 shows surgical emphysema; calcified lymph-node at right hilum; and dense opacity in right lower zone.

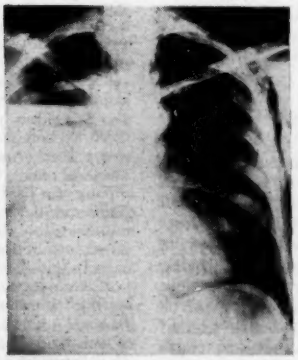

Fig. 4—Film taken on third day in case 3 shows surgical emphysema; calcified lymph-node at right hilum; and fluid level on right side with almost total density below it.

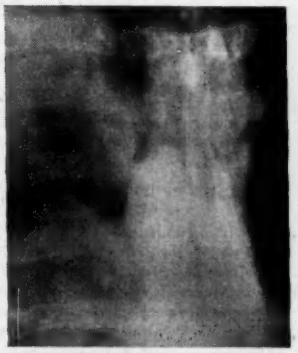

Fig. 5—Enlargement of part of a film taken on third day in case 3 after a barium swallow which showed surgical emphysema; calcified lymph-nodes at right hilum; barium in œsophagus, stomach, and mediastinum.

seen to escape. Radiography immediately afterwards showed much surgical emphysema, with density at the right costophrenic angle (fig. 3).

Progress.—Three hours later the chest was again needled with a pneumothorax machine, and 200 c.cm. of air was withdrawn. Radiography after this showed little change other than an increase in the total density on the right side and in its extent at the right base. The patient was still in considerable pain and was given morphine six-hourly and large doses of penicillin. He was seen the same afternoon by the consultant physician, who diagnosed spontaneous rupture of the œsophagus but considered, in conjunction with his surgical colleague, that the patient's general condition was such that he was quite unfit to undergo thoracotomy. Conservative treatment was decided on, antibiotic therapy was maintained, and all fluids were administered by tube. The patient seemed much improved next day, and needling of the right side of the chest led to the aspiration of 30 oz. of dark-brown fluid, which was sterile and contained no bile pigments or free hydrochloric acid. A rectal drip was set up and continuous drainage of the pleural cavity maintained. A barium swallow was given on the third day to find the rupture with a view to thoracotomy when the patient seemed sufficiently improved. Screening showed a dilated œsophagus; the medium, being thin, passed readily into the stomach, and none was seen to enter the pleural cavities or the mediastinum. The X-ray picture at this stage showed a left pneumothorax with moderate relaxation of all lobes, a right hydropneumothorax, and extensive surgical emphysema (fig. 4). That evening the temperature and pulse-rate began to rise, and the fluid from the right chest yielded growths of *Staphylococcus pyogenes* and *Streptococcus viridans*. Although an intravenous drip had been set up, the patient complained of thirst, and an attempt was made to relieve this with water by Ryle's tube. Next day the surgical emphysema was much less, and the chest seemed to be clearing. The patient's temperature was normal and pulse-rate 100. There was little change in his condition until the eighth day, when his temperature rose to 101°F and the pulse-rate from 80 to 120, and he began to cough up stringy mucopus. Even at this time his condition did not cause anxiety, and his death on the tenth day after the rupture was sudden and unexpected.

Necropsy revealed that death was due to profuse secondary hæmorrhage from a large mediastinal abscess caused by extensive longitudinal rupture in the right posterolateral wall of the middle third of the œsophagus. There was brown fluid in the right pleural cavity, and the whole of the right lung had collapsed from secondary hæmorrhage. The left lung appeared normal, and only a little fluid was found in the left pleural cavity. The abdominal contents were normal except for the stomach, which showed evidence of acute gastritis.

Comment.—The signs and symptoms in this case were almost entirely confined to the chest. Again there was no clear evidence of vomiting at the actual moment of the acute onset of pain. Surgical emphysema appeared very early and, although the case was originally diagnosed as a spontaneous pneumothorax, the correct diagnosis was made very early, within eighteen hours of the rupture. Conservative treatment was decided on in view of the patient's condition, and it seemed at first as if this course would succeed, but infection supervened. A barium swallow had seemed to indicate closure of the rupture at the stage when the improvement in the patient's condition had suggested that it might be possible to attempt thoracotomy. It appears in retrospect, however, that barium was really passing through the œsophagus and the walls of a thick abscess cavity. Close examination of the radiographs seems to indicate that there was pocketing of the barium at the rupture, with evidence of leaking (fig. 5). The site of the rupture was unusual, and it is perhaps significant that it was in juxtaposition to a calcified node, which can be seen in the radiographs. There may well have been some weakness in the œsophageal wall at that site, possibly due to fibrosis and responsible for the fatal rupture. This case amply demonstrates the need for surgical intervention after early diagnosis, since everything here seemed to give reasonable grounds for hope that conservative treatment would succeed. In spite of the fact that the patient survived ten days, the end-result is yet another indication that immediate surgery, in spite of a seemingly poor condition, offers virtually the only hope in these cases.

Summary

Three fatal cases of pressure rupture of the œsophagus are reported. The salient features of the catastrophe are reviewed, and previously published cases are briefly reviewed.

The place of pressure rupture of the œsophagus in the differential diagnosis of alimentary and thoracic disasters is reassessed, and emphasis is laid upon the value of its inclusion in surgical teaching.

The importance of early diagnosis and early surgical intervention is reiterated.

I wish to thank Dr. J. D. Craig, Mr. E. H. C. Harper, F.R.C.S., and Mr. R. H. Percival, F.R.C.S., for permission to publish these cases; Dr. J. M. Corall for permission to publish the X-ray prints, and St. Thomas's Hospital Photographic Department for the prints; Dr. John Anderson, Mr. N. R. Barrett, F.R.C.S., and Dr. J. W. McLaren, for much helpful advice and criticism; Mr. L. M. Payne, assistant librarian of the Royal College of Physicians, for permission to study the original description by Boerhaave; and Miss J. Dewes for drawing fig. 1.

References overleaf

SADDLE EMBOLUS

SURVIVAL WITHOUT OPERATION IN A PROVED CASE

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SADDLE embolus of the aortic bifurcation is uncommon, and survival after it, especially without embolectomy, is not often recorded. In the case reported here the diagnosis was proved beyond all doubt.

Albright and Leonard (1950) collected 4 cases of apparent spontaneous recovery, 8 of recovery following conservative treatment, and 6 of "recovery with loss of tissue" following conservative treatment. Andrus (1950) reported 2 further cases of recovery with loss of tissue in cases treated conservatively. In none of these 20 cases has it been possible to trace evidence that the diagnosis was definitely proved. No more recent report of recovery without embolectomy has been traced.

Direct confirmation of the diagnosis is necessary because Daley (1943) mentioned 2 cases in which the emboli proved at operation to be more distal than had been diagnosed. He thought that the clot had been carried distally owing to disimpaction. Ewing (1950) has claimed that all cases of reported survival, without embolectomy, of patients with saddle embolus are due to breaking up and migration of the clot. Possibly, however, the emboli were situated more distally from the outset; therefore none of the above-mentioned cases can be regarded as proved.

Case-record

A man, aged 29, was admitted to the Derbyshire Royal Infirmary on Aug. 8, 1950, with a history of ten years' dyspnœa on exertion, and known mitral stenosis for the last year. Ten days before admission he had, after exertion, an attack of aphasia, associated with difficulty in using both hands, which lasted an hour. Three days later he had severe abdominal pain lasting several hours, and vomiting. Twenty-two hours before admission there was a sudden onset of weakness, stiffness, and very severe pain in both legs, worse in the left; the severe pain continued, and he lost all use of his legs.

On admission he was well built, severely shocked and sweating, with a rapid feeble pulse, and in very severe pain. His heart was enlarged, with uncontrolled auricular fibrillation. His blood-pressure was undetectable. His liver was moderately enlarged, and he had scattered rhonchi in his chest. Both his legs were cold, more so peripherally, with a clear upper level at the waist. Below the waist his skin was white with cyanotic mottling. No pulse was detected, then or ever after, in either leg. No movement was possible in the lower limbs, except a little in the right big toe. Pinprick was faintly appreciated in the right leg; no other form of sensation was demonstrable in the legs, but pain made accurate testing impossible.

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Treatment.—Since the very severe shock made embolectomy impossible, treatment was conservative. *Ethyl biscoumacetate* was given from the time of admission: 1500 mg. in the first two days, followed by 300 mg. once or twice daily. The prothrombin-time reached 34·5 sec. on the day after admission, and thereafter remained generally 25–40 sec. (normal 10–20 sec.). On only four occasions during the first ten weeks did it fall below 20 sec. Heparin was given until the prothrombin-time became prolonged, two doses of intravenous heparin 5000 U being followed by intramuscular heparin 12,000 U every six hours. *Oxygen* was given for several days without obvious effect. Very large amounts of *morphine* were given during the first few days; but even these did not control the pain completely. *Massive initial digitalisation*, followed by maintenance dosage, controlled the fibrillation. *Tolazoline* 25 mg. t.i.d. was given from the second day onwards. Paravertebral block was done on the eighth and fourteenth days but, though technically successful, it appeared to have no lasting therapeutic effect and was therefore not repeated. *Penicillin* had been given before admission. Alternate courses of this and of streptomycin were given to control infection. They appeared effective, for no serious infection developed, though for several weeks there was an irregular pyrexia due to toxic absorption from dead tissue.

Progress.—Shock gradually passed off during the next few days, and an obvious mitral diastolic murmur appeared. In the right leg warmth and movement began to return on the day after admission; by the end of a week it was quite warm and a little œdematous, and a trace of pulsation could be detected by oscillometry. By this time the left leg was quite warm to the knee; below this it was cool, and below the ankle it was stone-cold. There was some ascites. Subsequently the left leg became warm down to the ankle, but the left foot developed dry gangrene with a line of demarcation at the ankle, where it began to separate. Pain disappeared, and the patient's general condition improved, but progress was delayed by toxic absorption from the dead tissues and a sacral bedsore; the latter responded well to treatment once the circulation was restored. At three and a half months, after the dosage of ethyl biscoumacetate had been reduced, the patient had two small pulmonary emboli, but after readjustment of the dose there was no recurrence of this complication. At this stage the general condition was good, fibrillation was well controlled, and there was no sign of cardiac failure. Both legs were pulseless, and there was some trophic parakeratosis in the right leg. The muscles of both legs were wasted and weak, moderately in the right leg but severely in the left, these changes being more severe peripherally. Sensation was reduced on the anterior part of the right foot and absent from the knee down in the left leg. The right leg was still œdematous. The patient spent Christmas in bed at home. Slow improvement continued, œdema subsiding and power increasing in the right leg. Seven months after the onset the patient was slowly mobilised and discharged home, still taking ethyl biscoumacetate.

Operation.—He was readmitted a month later for below-knee amputation of the left leg. Operation showed that the muscle-fibres were necrotic up to the level of amputation, the main tibial artery was occluded by thrombus, and its walls were thickened. The stump healed well in fourteen days. The patient was given quadriceps drill and walking exercises, and discharged home on May, 1, 1951. Ethyl biscoumacetate was discontinued.

Death.—At noon on June 5, 1951, while sitting in a chair, he complained of sudden buzzing in the ears; this was followed by progressively increasing dysphasia. He finally lost consciousness at about 8.30 P.M. while on the way to hospital. On admission he was sweating and comatose. He was fibrillating with a rapid ventricular rate, but cardiac failure was not increased. Both pupils were dilated, but there were no focal nervous signs. He died at 9.30 A.M. next day, ten months after the date of his saddle embolus.

Necropsy Findings.—The heart weighed 21 oz. The left auricle was greatly enlarged and contained much ante-mortem thrombus (fig. 1), but the right auricular appendage was empty. There was severe mitral stenosis, with calcification of one valve margin; there were no vegetations, and the other valves were normal. The bifurcation of the basilar artery was blocked by ante-mortem thrombus, microscopically apparently an embolus, and the corresponding parts of the brain-stem and cerebellum were soft and diffluent. The lungs showed a few fairly recent adhesions and terminal pulmonary

œdema, but no fresh infarcts. The spleen and kidneys contained infarcts; the liver showed nutmeg changes, and its left lobe was very pale and fatty, suggesting a very large infarct. The aorta was normal down to the origins of the renal and inferior mesenteric arteries; below this it narrowed in a fusiform manner to the bifurcation, where its diameter was less than half the normal size. The internal and external iliac arteries formed firm fibrous cords, the lumen being patent but of almost microscopic size. Below the inguinal ligament the femoral arteries increased somewhat in lumen and evidently received blood from a collateral source. It was impossible to demonstrate the path of the collateral circulation; although the lumbar and superficial epigastric arteries were patent they did not appear enlarged. There was nowhere any evidence of recanalisation. When the lower part of the aorta was opened, an area extending one inch above the bifurcation was found to be occupied by fully organised hard clot firmly bound to the wall. For two inches above this the lumen was occupied by successive layers of laminated clot, the lowest showing considerable organisation (fig. 2).

Fig. 1—Necropsy specimen, showing enlarged left auricle containing ante-mortem thrombus, and part of stenosed mitral valve.

Discussion

When embolism affects a limb artery, embolectomy is not always advised, though many consider it of value when it is possible within the first few hours. Embolectomy is still strongly advised for saddle emboli of the aorta, principally because survival without it is considered very unlikely. Even after embolectomy the mortality is high, for Albright and Leonard (1950) could collect only 25 successful embolectomies; Ewing (1950) has since added 2 cases, Andrus (1950) 1 case, and Shipman and Goodwin (1951) 1 case. Much depends on the time factor, for Albright and Leonard calculated that more than half the patients can be saved by operation within eight hours. In only 3 of these 29 successes was the patient operated on more than ten hours after onset.

Fig. 2—Lower part of aorta with both internal and external iliac arteries, opened to show clot, lower part of which is fully organised while upper part is laminated and more recent. Iliac arteries are empty, and their lumen is minute.

The present case proves that survival without operation is possible. Such survival may be commoner than is usually supposed; owing to the great difficulty of proving the diagnosis without either operation or necropsy some cases may have passed unrecorded. When the patient reaches hospital within a few hours and can be rendered reasonably fit, there seems little doubt that embolectomy is far the best treatment; but when more than twelve hours have elapsed, especially if the patient's condition is poor, conservative treatment may sometimes be wiser.

Even if treatment may occasionally be conservative, it should always begin at the earliest possible moment, not only to save life and limb but also to minimise subsequent disability. Most tissues can survive only a few hours without oxygen, and it was forty-eight hours after onset before any definite circulation could be demonstrated in this patient's legs. The surviving portions of his lower limbs suffered a disabling weakness due to muscle necrosis, estimated by Lewis (1936) to develop from six to eight hours after anoxæmia, and some permanent sensory loss. The latter was attributed to anoxæmic damage to peripheral nerve-fibres, for Welch and Rolleston (1909) concluded that man was not among those species in which aortic occlusion causes death of tissues in the spinal cord.

The need both for morphine and for digitalis was obvious, and both were of great value. The treatment of shock was considered urgent, both to save life and to improve the collateral circulation, and it presented a difficult problem, for the coexistence of cardiac failure contra-indicated intravenous therapy. Intra-arterial transfusion may possibly find an application in such cases in the future.

It is more difficult to assess the effect of spasmolytic therapy. Mulvihill and Harvey (1931) have shown that sudden occlusion of a main artery reduces the limb rapidly to room-temperature; after some hours its temperature rises fairly suddenly, reaching normal after, on the average, thirteen hours.

Sympathectomy during the early hours raises the temperature to normal immediately. It is debatable whether the initial fall in temperature is due to active vasospasm, relaxation of which returns the temperature to normal; or whether it is due simply to the mechanical effects of a total block in the normal channel of blood-supply, there being a delay of several hours before the collaterals dilate beyond their normal limits to restore the blood-supply (Pickering 1951). Whichever explanation is correct, anything which helps to relax the collateral arteries during the first 12–24 hours will accelerate the restoration of blood-flow.

Sympathectomy, as Mulvihill and Harvey (1931) showed, has this effect. In cases of saddle embolus a patient fit enough, and seen early enough, for sympathectomy will usually be suitable for embolectomy. Lumbar sympathetic block is suitable even for a desperately ill patient. It was done in this case with technical success but so late that it cannot have materially affected the outcome; by that time the survival or necrosis of the various tissues was already decided. In fact, once the secondary vasodilatation described by Mulvihill and Harvey has taken place, it is doubtful whether any

vasodilator measure will have much further effect; the accumulated metabolites in the ischæmic tissues exert at this stage a localised and possibly maximal action. Some workers (Cole and Kleitsch 1951, Hohf et al. 1953) have reported dangerous hæmatoma formation due to paravertebral block done during anticoagulant therapy. Both for safety and for efficiency it is suggested that paravertebral block should be done in future only when the patient is first seen and before the first injection of heparin.

Tolazoline therapy was begun earlier and was probably of some value. It has the advantage, in cases of this type, of not lowering the blood-pressure, as do the methonium compounds.

Prompt anticoagulant therapy appeared to be the most effective measure. It is still unsettled whether, in man, such therapy can produce true recanalisation of a main artery, with formation of a substantial channel. In the present case no such recanalisation took place, but by preserving the collaterals from obstruction by secondary clot most of the ischæmic areas were saved. This supports the conclusion of Allen et al. (1946) that blockage of a main vessel alone is insufficient to cause gangrene. Some secondary clotting had probably taken place before treatment began, for Albright and Leonard (1950) have found this as early as one and a half hours from onset. Had it been possible to start treatment sooner, all loss of tissue might well have been avoided.

Lord and Burke (1953) very rightly emphasise that in these cases saddle embolus, great though its immediate importance, is commonly but one of a series of thrombo-embolic incidents. After recovery the prognosis depends on the liability to further embolism. Little is directly known of the efficiency of anticoagulants in reducing the formation of clots within the auricle, but they are well known to keep the ventricle free from loose clot after coronary thrombosis. The present patient remained free from further embolism for many months while efficient anticoagulant therapy was maintained, and his fatal cerebral embolism may well have been related to discontinuation of this therapy a month earlier. Despite the inconvenience involved I suggest that such patients might best be kept continuously under anticoagulant treatment either as a permanent measure or until the auricle can be explored. Peripheral embolism has recently become an indication for exploring the mitral valve; and, though the present patient was not otherwise an ideal subject for valvotomy, because his auricle was very large, this operation might have been preferable to permanent tromexan therapy.

Summary

A case of proved saddle embolus is reported in which the patient survived with loss of tissue (classification of Albright and Leonard 1950) for ten months without embolectomy. If treatment had been begun earlier, loss of tissue might have been avoided.

No previous similar case has been traced, but there have been reports of survival in unproved cases.

The conservative treatment of patients unsuitable for operation is discussed, with special reference to the importance of anticoagulant therapy and treatment of shock, the limitations of spasmolytic therapy, and the prevention of further emboli in survivors.

I wish to thank Dr. D. V. Hubble for permission to publish this case and for valuable criticism and advice; and Dr. I. Mackenzie for the necropsy report.

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AORTIC EMBOLECTOMY

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Burt, Learmonth, and Richards (1952) described 16 cases of sudden aortic occlusion. Of these, 8 were treated conservatively with 6 deaths; while 8 were treated by embolectomy with 4 deaths. The mortality from occlusion of the aorta by embolus is high, but embolectomy appears to offer a better chance than conservative treatment of survival and circulatory recovery. Murray (1943) strongly advocated operation.

Ewing (1950) pointed out that the number of reported successful aortic embolectomies was not great, and himself reported 2 cases "if only because in these two cases the operation proved much simpler than was expected." For this latter reason, and because of the immediate and complete recovery after operation in contrast to the high mortality and morbidity of conservative treatment, the following case is recorded.

Case-report

A married woman, aged 54, was admitted to the surgical wards of the Victoria Infirmary on April 9, 1954. Three hours before admission, having returned home from a run in her car, she noticed a mark on her front-door steps. While sweeping the steps she felt pain and a sensation of "something giving way" in the precordium. She walked into the house and sat down, as she did not feel well. Immediately she was aware of a sensation of pins-and-needles in her feet and legs, and within seconds she realised that she could not move either lower limb. Her husband carried her to bed, and about an hour later she was seen by Dr. John Fraser, the general practitioner called in, who correctly diagnosed aortic embolus straddling the bifurcation.

On examination at the time of admission the patient's general condition was very good. Her face was somewhat flushed, and there was definite venous congestion of the neck, upper thorax, and upper limbs. The pulse was rapid and irregular, but of good quality. The blood-pressure, initially 170/90, rose to 200/100 mm. Hg within an hour. Clinical examination revealed rapid auricular fibrillation with a gross systolic murmur all over the precordium. The abdominal wall below the umbilicus was profoundly cyanosed and cold; the skin was not anæsthetic. Bowel sounds were normal, and the patient did not complain of any undue pain.

Both lower limbs were cyanosed and in places marled. The left lower limb could not be moved, but the patient could slightly flex the right knee. The superficial veins were congested. The skin of the feet, legs, and lower thighs was intensely cold. In the left leg this extreme coldness extended to the junction of upper and mid-thigh, whereas on the right side it extended only to the junction of the lower and mid-thigh. The left lower limb was anæsthetic to a point just above the knee, but on the right side there seemed to be some sensation as low as the ankle. No peripheral pulse could be felt in the common femoral, popliteal, posterior tibial, or anterior tibial arteries on either side. Aortic pulsation was detected in the upper abdomen and was felt directly through the umbilicus. Aortic embolus straddling the bifurcation was diagnosed.

Operation

This was undertaken six hours after the onset, and the embolus was extracted an hour later. Some delay in starting the operation was caused by: (1) the need to obtain from the

DR. WALKER: REFERENCES—*continued*

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blood-bank blood of the correct group; and (2) vomiting during the induction of anæsthesia, and inhalation of some of the vomit.

Anæsthesia (Dr. A. Kilpatrick) was induced with thiopentone sodium and maintained with nitrous oxide and oxygen and intravenous pethidine. Gallamine triethiodide ('Flaxedil') was given for intubation and as required during operation. Respiration was controlled with a 'Blease Pulmoflator.'

The abdomen was opened with a left rectus splitting incision. The wound bled freely in its upper part, but not at all below the level of the umbilicus. The peritoneal cavity was opened, and the gut packed off; the aorta and its terminal branches were exposed to a level above the origin of the inferior mesenteric artery, and both common iliac arteries were exposed for 2 in. distal to their origin. All of those vessels appeared to be smaller than normal and were presumably in spasm. True pulsation was felt in the inferior mesenteric artery and in the aorta, to within $^1/_2$ in. of the bifurcation. No pulsation was visible in either common iliac artery. The solid clot was felt in the lowest $^1/_2$ in. of the aorta, the uppermost $^1/_2$ in. of the right common iliac artery, and the uppermost 1 in. of the left common iliac artery. The clot, by reason of its dark purple colour, was also seen through the arterial walls. The aorta was cleared round its entire circumference and hæmorrhage from the aortic side was controlled by a mitral-valvotomy clamp under hand control. The distal parts of the common iliac arteries were controlled by digital pressure, exerted by two assistants, one of whom also held the clamp. The left common iliac artery was incised near its junction with the aorta; the incision was $^3/_8$ in. long. Immediately this incision was made the clot popped through it. It was gripped with Desjardin forceps. The first two attempts at extraction were unsuccessful, in that the small protruding portions of the clot became detached; but on the third attempt the remaining clot came out complete (see figure). Each control was separately and in turn released, to determine whether blood now flowed from each direction. The controls on the iliac arteries were removed first, in the hope that any retrograde flow might expel any fragments of clot or thrombus from these vessels. The flow was sluggish and consisted of dark blood. The wound in the left common iliac artery was closed with two silk sutures, and thereafter no leakage of blood occurred.

Anterior view of embolus removed at operation.

Postoperative Period

Immediate.—(1) The systolic blood-pressure fell to 120 mm. Hg immediately after all controls were removed. (2) The lower half of the wound was bleeding briskly during the closure. (3) Pulsation of the peripheral vessels of the lower limbs was palpable by the end of the operation (no attempt was made to feel these pulses before the abdominal wound was closed). (4) The colour of the lower limbs immediately improved, but the limbs were still cold.

At six hours.—The skin of the lower abdomen and the lower limbs was warm and looked normal. The patient was able to move both legs, though still not very strongly, and she still complained that the left foot felt heavy and leaden. Peripheral pulses were normal. The anæsthesia of the left foot and ankle region was still present.

At four days.—The patient was generally well. The pulse-rate had remained rapid for three days, but had then fallen and was now 108 per minute. The pulse was regular and there was no evidence of fibrillation. The condition of the lower limbs was very satisfactory. The patient could now move them freely; their colour and temperature were normal; and all peripheral pulses were present and equal. Objectively sensation was normal, but the patient still complained that the left foot and ankle region felt heavy and numb, and she occasionally had a feeling of pins-and-needles in that area.

Follow-up

The patient was last examined on Aug. 21, 1954. Her condition is in every way very satisfactory. She is now leading a normal, active life, and does her own housework and shopping; but she rests in the afternoons. She walks without any aching or tiredness in the lower limbs, which do not feel cold. The lower limbs are normal in colour, warmth, muscular power, and sensation. Strong pulsation can be felt in the superficial femoral, posterior, and anterior-tibial arteries of both sides. Clinically no cardiac abnormality is detectable.

Discussion

Onset and Clinical Picture

This has been fully discussed by McClure and Harkins (1943), Burt et al. (1952), and others. Many workers have emphasised the severity of the pain in these cases. But in the present case, although the patient complained of pain, her chief worry seemed to be fear at finding her lower limbs suddenly paralysed. The left side was the worse affected clinically, and at operation the limb of the clot extended down the left common iliac artery for 1 in., whereas in the right artery the clot extended for only $^1/_2$ in. Since the block was apparently complete on both sides, and no additional branches were occluded by the longer clot, I presume that in the main vessel and its collateral arteries the greater the length or size of the clot the greater is the resulting spasm.

Source of Embolus

Aortic embolus is commonly associated with pre-existing rheumatic carditis with auricular fibrillation. In the present case there was no evidence of this, though the patient did state that she had had chorea twice in childhood. On admission to hospital fibrillation was present, and a loud systolic murmur was audible all over the precordium. Within a few hours of embolectomy the pulse was regular, though rapid, and the heart sounds were normal. Subsequent clinical and radiographic examination failed to reveal convincing evidence of mitral stenosis. It is difficult to conceive of clot massive enough to occlude the aorta passing through a grossly narrowed mitral valve.

Another possible source is ventricular infarct, but in the present case there was no history suggesting the prior occurrence of this condition, and electrocardiography showed no deviation from the normal. Origin on the venous side, with passage through a patent foramen ovale, is another possibility, but in this case there was no evidence of such a cardiac defect.

Operation

Approach.—The usual approach is transperitoneal. This has the advantages of giving adequate exposure of all vessels concerned, and of being familiar to the general surgeon. Murray (1943), who reported the largest personal series, had used the extraperitoneal route, which does have the one advantage that the contents of the peritoneal cavity are more readily retracted.

Control of hæmorrhage.—The control of hæmorrhage from the aorta and from the common iliac vessels is one of the main problems of operation. Linton (1945) advised the use of a Bethune tourniquet clamp; but this is not often readily available, and to apply it the vessels must be raised from their bed. Digital compression, which has been advocated by Madden (1951), is the method least likely to damage the vessels either directly or indirectly, since there is no need to dissect the vessels from their surroundings. In the present case the iliac vessels were easily controlled digitally. Control of the aorta is more difficult. The available surface of the aorta below the inferior mesenteric artery is, at most, $1^1/_2$ in. long, and if it proved necessary to incise the aorta itself the compressing finger might

interfere with good access for repairing the incision. In the present case the assistant had to use his hand for retraction, to afford good exposure, and for digital compression. Control thus applied seemed precarious. The aorta was mobilised and was compressed by hand control of a mitral-valvotomy clamp. In the event much less compression was required than had been expected, and in retrospect it would seem that even in a moderately stout person, such as the patient in the present case, digital compression would be best.

Incision of the vessel.—Direct incision of the aorta over the clot has the advantage that the widest part of the clot is approached through the widest vessel; Madden (1951) has suggested an incision of 3 cm. in the aorta, which seems unnecessarily long. Incision of the aorta has, however, disadvantages. The surface of the aorta available for incision is limited by the low origin of the inferior mesenteric artery and by the simultaneous compression of the vessel. This limitation would be most troublesome when repairing the incision in the vessel. If difficulty should be experienced in closing the incision satisfactorily, and resort had to be made to ligation of the lower aorta, then nothing would be gained by operation. In the present case the clot was easily compressible and the wide aortic portion slipped out of a very tiny incision in the iliac vessel. Thus the best course would seem to be incision of one of the common iliac vessels close to, but not over, the junction with the aorta. The common iliac artery of the side worse affected seems the obvious choice, since the manœuvre of extraction may lead to the sacrifice of the vessel (Ewing 1950). Closure of the $^3/_8$-in. incision in the vessel with two interrupted stitches of fine silk on an eyeless needle fortunately resulted in immediate complete "watertight" closure.

Anticoagulants.—Ewing (1950), Murray (1943), and Linton (1945) all favoured the administration of anticoagulants in the postoperative period; but Burt et al. (1952) concluded that they should not be administered. In the present case it was decided not to use these drugs; admittedly this decision was based simply on the fear of leakage from the site of incision. The administration of anticoagulants is probably unreasonable where the clot is firm, preformed centrally, and suddenly transported to a distant site in a healthy vessel. The incision in the present case was tiny, and it was made in an apparently normal, large artery; so it was hoped that no serious clotting would take place. In the event this hope was justified.

Ewing has suggested that the anticoagulant drugs might usefully be given in the period between the onset of embolism and operation, with a view to preventing the further formation of clot in the distal vessels. He suggests that the anticoagulant effect could be corrected immediately before operation.

Summary

A successful aortic embolectomy is reported.

The operation and aftercare proved simpler than had been expected, and no special instruments are required.

The general surgeon should consider embolectomy as soon as the diagnosis has been made.

I should like to thank Mr. Robert Mailer, in whose wards the patient was treated, for his very helpful advice and criticism in the preparation of the report. The specimen was photographed by Mr. James Gray, of the medical photographic department of the hospital.

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EXTRAVASATION OF URINE AFTER IRRIGATION OF THE BLADDER WITH HYALURONIDASE

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FEW reports have been published in this country on the use of hyaluronidase in urology, but in America this enzyme has been used for dissolving urinary stones after Nairns et al. (1948) found that some urinary calculi became fragmented when immersed in a solution of hyaluronidase.

It has long been held that the formation of urinary stones may be related to diminished urinary excretion of colloids (Illingworth and Dick 1947). Butt et al. (1952a) found that injections of hyaluronidase increased the urinary excretion of colloids, prevented recurrence of stones, and caused stones already present to become less dense and smaller radiologically.

In the case reported here hyaluronidase was used in an irrigating solution in an attempt to get rid of phosphatic encrustation on the wall of the bladder, so that a growth could be properly examined. The result was unexpected.

Case-report

A woman, aged 70, complained of intermittent painless hæmaturia for six months. There were no other symptoms and no abnormal physical signs. Her urine contained blood but was sterile on culture; her blood-urea level was 48 mg. per 100 ml., and Hb 84% (14·8 g. per 100 ml.). An intravenous pyelogram was normal.

At cystoscopy the whole of the bladder mucosa was congested, and on the right side a papilliferous growth was present, just within the internal meatus, on an arc from 6 o'clock to 12 o'clock. This was heavily encrusted with phosphatic deposits and hidden by debris, which extended beyond the growth. A biopsy specimen showed a necrotic but well-differentiated papillary carcinoma. The full extent of the bladder growth could not be estimated, because of the encrustation; so it was decided to irrigate the bladder with a solution containing hyaluronidase in the hope that this would dissolve the deposits and so make more detailed cystoscopy possible.

Result of Irrigation of Bladder.—The solution contained one ampoule of hyaluronidase, 450 turbidity-reducing units (Meyer 1947) per litre of solution G (Suby and Albright 1943), and was used at a rate of 4 or 5 litres a day with a St. Mark's tidal-irrigation apparatus. The patient had low-grade pyrexia but was otherwise well until five days after the irrigation began. She then had several loose motions on the morning of the fifth day and complained of abdominal pain. Her temperature rose, and after a rigor the lower part of her abdomen became distended and got steadily worse. A few hours later œdema and redness of the lower abdominal wall appeared, being more accentuated on the right. The signs were those of extraperitoneal extravasation of urine from the bladder, and it was plain that an urgent operation was necessary.

Operation.—The abdomen was opened through a lower midline incision, and 200–300 ml. of offensive purulent fluid was found in the extravesical and extraperitoneal tissues. There was no evidence of any leakage or of a perforation at the site of the growth on the right side of the bladder, but there was necrotic tissue in the extravesical layers on the left side. When the bladder was opened, the findings were the same as those on cystoscopy, and there was still no sign of any perforation through the growth or elsewhere. A little serous fluid was found when the peritoneum was opened, and the bowel in the lower part of the abdomen was covered with inflammatory exudate and adherent to the dome of the bladder. The peritoneal surface of the bladder was

intact. After the peritoneum had been closed, the growth was removed by diathermy excision and coagulation of its base. The bladder was completely closed, and an indwelling Foley catheter was inserted per urethram. A corrugated drain was placed in the perivesical space. After the operation the patient's condition deteriorated steadily, and in spite of blood-transfusions and antibiotics she died of uræmia three days later.

Necropsy confirmed the findings at operation. There was no evidence whatever of a perforation of the bladder. The extravesical tissues were acutely inflamed, and there was pus in the perivesical space and on both sides of the bladder, especially on the left side. There was early bilateral pyelonephritis, which was presumably a terminal event, but there was no other significant abnormality in any other organ. The only likely explanation of the findings in this case was that hyaluronidase had caused infected fluid to pass through a macroscopically intact bladder wall.

Discussion

For many years it has been known that colloids in urine play a part in preventing precipitation of the supersaturated urinary crystalloids (Lichtwitz and Rosenbach 1909). Colloids are diminished in, or even absent from, the urine of habitual stone-forming patients, but after the intramuscular injection of hyaluronidase the urinary excretion of colloids may be increased according to Butt and his colleagues (Butt 1952, Butt and Hauser 1952, Butt et al. 1952b), who report that some patients who had previously formed stones repeatedly were free from them for twenty-one months when receiving injections of hyaluronidase.

Crystals precipitated in the urine only adhere to form stones when bound together by some substance derived from urinary colloids (Ebstein 1884, Lichtwitz 1919, Schade 1923). Lichtwitz (1919) stated that this substance contained, among others, chondroitin-sulphuric acid and a complex nitrogen-containing polysaccharide, which Nairns et al. (1948) suggested might be hyaluronic acid. Humphrey (1946) showed that hyaluronidase acted on both these substances. Nairns et al. found that hyaluronidase solutions produced fragmentation in vitro of five out of eight urinary calculi on which solution G had no appreciable effect. This failure of solution G and similar solutions to dissolve urinary stones is explained by the presence of impervious colloid layers which protect the crystalloids as well as bind them together (Keyser 1943). The ability of hyaluronidase to penetrate such colloid layers may be valuable in overcoming this difficulty, which has so far prevented dissolution of urinary stones, although Nairns et al. (1948) reported that irrigation with a solution of hyaluronidase was ineffective when used in a patient with a stone in the renal pelvis and in another patient with a stone in the bladder. There were no ill effects after using this irrigating solution.

Hitherto successful dissolution of stones by hyaluronidase has been achieved only by injections (Butt and Hauser 1952); but in the present case the clinical and necropsy findings all suggest that hyaluronidase used in an irrigating fluid caused fluid to pass through a macroscopically intact bladder wall, which was the site of an ulcerating growth. Although this was not proved, it has been shown experimentally that hyaluronidase can increase the permeability of the excised intact bladder wall in rabbits (Seifter et al. 1949), and further work is being done here to confirm this in the living animal and to find what effect ulceration of the mucosa has on the process. Hyaluronidase may have little effect on the human bladder wall when the mucosa is normal and no ulceration or tumour is present.

The mechanism by which hyaluronidase allows fluid to permeate tissues is suggested by Day (1950), who considers connective tissue to be a fabric of protein fibres which is impermeable largely because hyaluronic acid is present in the spaces between the fibres. When the hyaluronic acid is removed by hyaluronidase, fluids can pass easily through the tissue. Hyaluronic acid is also present, but in smaller amounts, between the adjacent cells of epithelium, in which also the spaces are smaller (Wyburn and Bacsich 1950). If this is the true explanation, it is likely that the intact mucosa lining the human bladder can be made permeable to fluids by hyaluronidase.

Summary

A case is recorded in which infected fluid is thought to have passed through an intact bladder wall because hyaluronidase was used in an irrigating solution.

Some of the properties of hyaluronidase are discussed.

We wish to thank Mr. W. W. Wiggins-Davies, F.R.C.S., for permission to publish and for help and encouragement; and Dr. E. M. Darmady and Dr. E. S. Duthie for advice and criticism.

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MEGALOBLASTIC ANÆMIA DUE TO PHENYTOIN SODIUM

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EARLY this year we made a careful study of a patient showing the typical blood picture of pernicious anæmia yet with free hydrochloric acid in the stomach and a normal gastric biopsy.

Known causes of megaloblastic anæmia—e.g., idiopathic steatorrhœa, gastro-intestinal abnormalities, liver disease, tapeworm, and inadequate diet—were excluded. The patient was an epileptic being treated with phenytoin sodium. Reports published hitherto of toxic symptoms and blood changes due to phenytoin sodium (Merritt and Putnam 1939, Finkelman and Arieff 1942) do not include megaloblastic anæmia, and the association was dismissed as coincidental until a similar example was mentioned to one of us (C. F. H.) by J. F. Wilkinson. Badenoch (1954) describes two similar cases in epileptics receiving drugs including phenytoin sodium and phenobarbitone, and suggests that the anticonvulsants could have played a part in producing the anæmia. Such cases of megaloblastic anæmia, as he remarks, seem to be hitherto undescribed.

This type of megaloblastic anæmia is rare, and the simultaneous occurrence of four cases with the common factor that each patient was an epileptic taking phenytoin sodium is strong evidence that this drug can produce

such blood changes. This would be the first instance—apart perhaps from the folic-acid antagonists (Stickney 1952)—of a drug causing megaloblastic reversion of the bone-marrow, and may throw light on the complex problem of the metabolism of vitamin B_{12} and folic acid.

Case-report

A man, aged 52, complained of undue dyspnœa on exertion, angina of effort, and slight œdema of the ankles. The symptoms, first noticed a year before his admission on April 21, 1954, had become progressively worse. For six weeks his friends had been remarking that he was paler than usual. His appetite was satisfactory and his diet normal; his bowels were normal; and his weight was unchanged. He had previously been healthy except for petit mal, which started at the age of 29. For this he had taken 'Epanutin' gr. $1^1/_2$ t.d.s. continuously for the last thirteen years, and no other drug. The attacks were infrequent and did not prevent him from doing a full-time responsible job. There were no fits or other relevant illnesses in the family.

On examination the patient was obviously anæmic and of spare build. He weighed 8 stone and measured 5 ft. 6 in. His tongue was normal. He was edentulous, but his gums were normal. He had a regular pulse-rate of 85, heart normal apart from an apical systolic murmur, blood-pressure 130/70 mm. Hg, lungs clear, and abdomen, central nervous system, and urine normal.

Examination of the blood showed red cells 1,270,000 per c.mm., Hb 35%, colour-index 1·34, white cells 2700 per c.mm. (differential count normal), packed cell volume 15·5%, mean cell volume 122 cμ, mean corpuscular hæmoglobin concentration 33·5%, clotting-time 9 min. (Lee and White method at 37°C), bleeding-time $1^1/_2$ min., and prothrombin-time 100%. The blood belonged to group O and was rhesus-negative. Blood-films and sternal bone-marrow (megaloblasts were 21% of 400 nucleated cells) were typical of pernicious anæmia. A fractional test-meal showed the normal amount of free hydrochloric acid. A biopsy specimen of the gastric mucosa taken with a Wood biopsy tube was normal. A barium progress meal showed normal stomach, duodenum, jejunum, ileum, and colon. A fat-balance test over twelve days was normal (94% absorption). Chylomicrography gave a low normal result. A glucose-tolerance test gave a high normal curve. Liver-function tests: van den Bergh direct reaction negative, serum-bilirubin 0·6 mg. per 100 ml., total serum-proteins 7 g. per 100 ml. (albumin 4 g. per 100 ml., globulin 3 g. per 100 ml.), serum-alkaline phosphatase 10 units, thymol turbidity 4 units, thymol flocculation 0, colloidal gold ±. A vitamin-C saturation test and a chest radiograph were normal.

Treatment.—The patient was given an injection of vitamin B_{12} 100 μg. Failure to respond to this was indicated by an unchanged serum-iron level after forty-eight hours (Hawkins 1954) and no increase in the number of red cells after fifteen days (Ungley 1949). There was, however, a minimal increase in the number of reticulocytes to 14%. Treatment with folic acid 30 mg. t.d.s. by mouth was then started, and there was a dramatic fall of the serum-iron level from 169 to 30 μg. per 100 ml. at forty-eight hours, with a reticulocyte response up to 37%. The red cells increased from 1,230,000 to 2,290,000 per c.mm. in fifteen days, and the blood-count returned completely to normal. The symptoms disappeared, and the patient returned to his previous full-time work. Epanutin has been continued in the same dosage throughout the investigations and treatment.

Discussion

This case of megaloblastic anæmia is quite unexplained in terms of known causes of such a condition. In view of three similar examples from Manchester and Oxford, it is impossible to avoid believing that an ætiological factor is the phenytoin sodium used in the treatment of all. It seems more likely that the drug, rather than the epilepsy, is the important factor. On this assumption it is curious that this type of anæmia has only been noted this year, although phenytoin sodium has been in use since 1938. Perhaps it may not appear until the patient, as in the present case, has taken the drug for a long time.

Vitamin B_{12} produced a submaximal reticulocyte response with no change in the number of red cells, yet there was a full response to folic acid; whereas one of Badenoch's patients responded to vitamin B_{12}, and the other to folic acid. This variation in response to therapy suggests the pattern found in malabsorption (Israëls and Sharp 1950). It is, however, unlikely that phenytoin sodium produces changes in the small intestine similar to those seen in the gums (Kimball 1939), for the radiological appearance was normal and there was no other evidence of an absorption defect.

The possibility that phenytoin sodium can act as a folic-acid antagonist has to be considered, yet it is difficult to explain on this theory the response to vitamin B_{12} in one case.

Further study is obviously needed not only to elucidate the pathogenesis of the condition but also to assess the frequency of such blood changes in patients taking phenytoin sodium.

Summary

An unusual case of megaloblastic anæmia is described. It is suggested that phenytoin sodium can cause a megaloblastic reversion of the bone-marrow.

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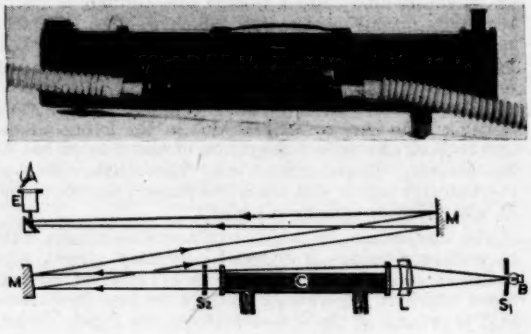
New Inventions

THE ROUTINE TESTING OF TRICHLOROETHYLENE INHALERS

THE increasing use of trichloroethylene inhalers for the production of general analgesia draws attention to the need for a simple and reliable method of checking their output. Now that trichloroethylene may be given with an approved inhaler by unsupervised midwives, the problem has become more urgent. Any inhalers used by midwives will have to be subjected to routine testing at least for the first few years, because it is not yet known how such inhalers behave in general use. The apparatus described below has been designed as a simple, cheap, and reasonably accurate device for determining concentrations of trichloroethylene between 0·1% and 0·7% vol./vol. in air.

When a simple mixture of air and trichloroethylene vapour is formed, the refractive index of the mixture differs slightly from that of air alone to an extent depending on the concentration of trichloroethylene. The change in refractive index gives rise to a convenient though non-specific method of making quantitative estimates of trichloroethylene. However, the change in index for a mixture of 0·5% trichloroethylene in air is very small, being about seven parts in a million, but this can readily be measured with some form of optical interferometer. The Rayleigh refractometer is very suitable for this purpose, but commercial forms are cumbersome and expensive, chiefly because of the need for using high-quality optically worked components. It has been found possible to introduce simplifications in the instru-



ment for routine tests on trichloroethylene inhalers, making it far cheaper and more compact.

The accompanying figure shows the optical system, which is still essentially that of the Rayleigh instrument. Light from a small bulb B illuminates a narrow slit S_1, and is converged by the lens into the eye-piece E, after reflection at several plane mirrors M, which shorten the physical length of the system. Two narrow slits S_2 give rise to coloured interference fringes which are observed in the eye-piece.

When trichloroethylene vapour is introduced into the chamber C, one light beam is retarded relative to the other because of the change in refractive index. This causes a movement in the fringes at E, which is measured against a graticule in the eye-piece and is simply related to the concentration of trichloroethylene. A correction must be applied if the atmospheric pressure and temperature differ greatly from standard conditions, but this correction is usually small and may be neglected in routine tests.

The chief modification is the use of a thin-walled gas chamber which enables the slits S_2 to be placed about 2 mm. apart instead of 2 cm., as is more usual. Several simplifications then follow. The fringe system is wider and easily seen under low magnification. The over-all dimensions can be reduced, leading to a more compact and portable instrument. The over-all dimensions of the model illustrated are 2 ft. × 6 in. × 6 in. The demands on the quality of components are so reduced that no optically worked parts are needed. Further, since only a limited range of concentrations of trichloroethylene is to be covered, the movement in the fringes can be measured directly, and the more orthodox secondary fringe system and compensator are eliminated. The use of white light enables the centre fringe to be identified.

The accuracy of measurements with white light fringes is limited, since the fringes are somewhat blurred when they are displaced appreciably from the central position. This blurring may be reduced by incorporating a filter in one half of the eye-piece; the white light fringes then serve for identification purposes, and the monochromatic fringes for more accurate readings. The error at a concentration of 0·6% vol./vol. is about ±3%—i.e., 0·60 ±0·02 vol./vol.

The diagram and the photograph were prepared by the department of medical illustration of Guy's Hospital. Patent rights for the device are vested in the National Research Development Corporation, which has supplied a grant for the construction of the illustrated model. The model was constructed by Messrs. Cox, Hargreaves, & Thomson Ltd., Kingswood, Surrey.

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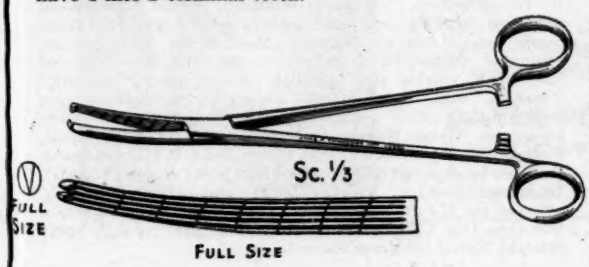
HYSTERECTOMY FORCEPS

THE instrument illustrated here was designed primarily for clamping the uterine vessels during abdominal hysterectomy; but in practice it has proved equally useful for securing the ovarian pedicles during vaginal hysterectomy.

This forceps, which is made of stainless steel, is strong but light and has a box-joint. The slender jaws are straight in the proximal half but slightly curved in the distal half. They have interlocking longitudinal deep-cut serrations interrupted by seven oblique cross-cuts and have 1-into-2 terminal teeth.



FULL SIZE

The blades clamp the tissues firmly without risk of slipping, and the terminal teeth grip the vaginal angles securely. Very little tissue is crushed and distorted; yet, in view of the slight curve, there is little risk of the centre of the pedicle retracting during ligation of the vessels. The handles are sufficiently long to permit application and removal under direct vision. The craftsmanship is excellent.

This instrument has been made for me by Messrs. C. F. Thackray Ltd., of Leeds.

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Reviews of Books

Basic Anatomy

G. A. G. MITCHELL, O.B.E., T.D., M.B., CH.M., D.SC., professor of anatomy, University of Manchester; E. L. PATTERSON, M.D., CH.B., B.SC., senior lecturer in anatomy, University of Manchester. Edinburgh and London: E. & S. Livingstone. 1954. Pp. 438. 45s.

THE medical student embarking on the study of anatomy is notoriously a prey to bewilderment and anxiety, for he finds it difficult to relate the subject to anything he has experienced before. Many anatomists attempt to help him by providing an introductory course which will serve him as a foothold among the spate of new facts and methods of thinking. Most of these courses deal briefly with generalities such as the concepts of growth and variation, the organisation of the nervous system, and so on; but at Manchester the introductory course is more extensive, and aims at providing the student with "a general knowledge of the entire body in his first term of anatomy."

This book, which is based on the Manchester practice, thus contains a chapter on the history of anatomy, an account of its scope and relationships to other sciences, a chapter on prenatal and postnatal development, and another on animal cells and tissues. So much is fairly common ground. But after this the book treats the body by systems, giving a synopsis of the more important features of each, both general and topographical. At the end, in place of references, there is a glossary of anatomical terms. There are 286 illustrations, which have a noticeable neurological bias: in the chapter on the vascular system, for example, 18 of the 34 illustrations show aspects of the nervous control of the system, and 6 of the 9 illustrations on the kidney deal with its nerve-supply. Many illustrations are duplicated—a few of them more than once, and the inclusion of some seems pointless. The text is uneven: it is sometimes over-simplified and sometimes, as in the section on embryology, so condensed that the new student will have difficulty in following it. Nor is the book entirely free from error—for example, in relation to the functions of the various cutaneous nerve-endings. Its chief weakness, however, is surely that it is an addition, not a replacement: the student who reads it is not thereby absolved from reading all the usual texts as well.

The "bird's-eye view" of anatomy is a good idea, as students testify. The difficulty is to select only the important landmarks.

Recent Advances in Endocrinology

7th ed. P. M. F. BISHOP, D.M. Oxfd, M.R.C.P.; endocrinologist, Guy's Hospital, London. London: J. & A. Churchill. 1954. Pp. 348. 30s.

EARLIER editions of this book were by A. T. Cameron, who wrote as a biochemist; this new edition, by a popular clinical teacher, covers a variety of topics by reviews or lectures. It makes no claim to be comprehensive; nor can it be said to be critical, and the serious student may at times wish that the author had been more explicit—for example, in his allusions to the Cori cycle and to the Krebs cycle, in the chapter on the endocrine control of carbohydrate metabolism. There are—perhaps inevitably—many repetitions, but the text is easy to read, and provides a means of becoming acquainted with a subject which has developed greatly in the last few years. Two chapters may be found particularly useful: a full and modern description of Cushing's syndrome

and an extensive account of testicular deficiencies. Other chapters deal further with the adrenal cortex and with the endocrine aspects of disorders of sex, with hormones and cancer, and with the management of thyrotoxicosis.

The Social Psychology of Industry

Human Relations in the Factory. Dr. J. A. C. BROWN. London: Penguin Books. 1954. Pp. 310. 2*s.* 6*d.*

FOR years after the Industrial Revolution the motives and attitudes of people at work were taken for granted and received little attention from their managers, or from scientists. The Hawthorne experiment showed the evils of this omission, and since then there has been a spate of observation and theory by social scientists of various disciplines, working from very different angles. It has not been easy to assimilate this, or to sift the practical from the theoretical, but Dr. Brown, out of his wide and detailed reading, has made a connected story.

He rightly gives due weight to the work of Elton Mayo and his earlier co-workers; and though he quotes and accepts some of the criticisms made recently, he demonstrates the revolutionary nature and brilliance of Mayo's investigations. It is rather disappointing that he does not follow up Mayo's repeated emphasis on social skills. Mayo felt that the war of 1939–45 could have been avoided if social skills had kept pace with technical; his challenge is now even more urgent, for since he wrote technical skill has gone on to produce the hydrogen bomb.

Dr. Brown provides excellent and stimulating accounts of the formal and informal organisations of industry, and of leaders and leadership. He is clear, succinct, and lively, and his phrases are often brightened by colourful allusions or down-to-earth illustrations.

His chapter on frustration may well be of great interest to medical readers, and should certainly be carefully read by all industrial doctors; it will stand them in good stead in their attempts to educate management on the effect of social conditions and personal attitudes on health and productivity. One of the tragedies revealed by Dr. Brown is that, in spite of all the work done, the grossest mistakes in human relations are still being made.

This book may provide a stepping-stone, and a firm one, to closer and wiser collaboration between medicine and management.

Ion Transport Across Membranes

Editor: HANS T. CLARKE. Associate editor: DAVID NACHMANSOHN. New York and London: Academic Press. 1954. Pp. 298. $7.50.

THIS book is a sequel to a conference held at the College of Physicians and Surgeons, Columbia University, New York, in October, 1953, on the rôle of proteins in ion transport across membranes.

It departs from the usual conference report in including invited reviews by experts who did not attend, and in omitting the scientific small-talk which follows or interrupts the opening papers. Although it was a "multi-discipline" conference, and the usual wish for greater mutual understanding is expressed, the actual interchange of views between the participants was informal, and is not recorded, so that the book in fact consists of a collection of review articles. For the medical reader, four of the fifteen reviews are outstanding: a general review by Ussing; Huxley on electrical processes in nerve conduction; Wilson and Nachmansohn on the generation of bioelectric potentials; and Mudge on renal mechanisms of electrolyte transport. Some of the remaining reviews are sketchy; others seem calculated to defeat the non-mathematical reader; and others are fascinating but remote from current medical application. For the research-worker in this field even the more recondite chapters will be valuable.

Kolpofotogramme zur Einführung in die Kolposkopie

Dr. Med. ROBERT GANSE. Berlin: Akademie-Verlag. Vol. I, pp. 19; plates 73; DM. 10. Vol. II, pp. 46; plates 14; photomicrographs 54; DM. 25.

THESE two volumes contain a description of the use of the 'Kolpofot' as a supplement to colposcopy in the prevention and early detection of carcinoma of the uterine cervix.

The apparatus, which has been made specially by Ihagee of Dresden, includes a Zeiss-Triotar 135 mm. f/4 lens, an Exakta-Varex camera, and extensible bellows all mounted on a mono-rail base. Illumination is obtained by an electronic ring-flash which surrounds the lens. Photographs at a high magnification obtained with this apparatus are reproduced on a series of plates which are remarkably clear and very well reproduced. The work is based on the earlier use of colposcopy by Professor Hinselmann, to whom this volume is dedicated. The photographs include several examples of normal cervix, erosions, areas of atypical epithelium, polypi, and other benign tumours of the cervix; and preparations used in colposcopy, such as those obtained after the acetic acid and Schiller tests, are also shown.

In vol. II a short introduction, including references, precedes some fine plates, several of which are accompanied by colour prints; but a group of photomicrographs at the end of the book, illustrating some of the plates, are not particularly good. The general theme is maintained, and conditions ranging from leucoplakia through various doubtful lesions up to carcinoma are illustrated.

Those who would use this supplementary diagnostic method must first become expert colposcopists; so however good the colpophotographs may be, the method has a limited use. For the early diagnosis of cervical carcinoma, a method within the compass of every practitioner would be more valuable.

Fundamentals of Neuropathology

WILLIAM BROOKS DUBLIN, M.D., chief, Laboratory Service, Veterans Administration Hospital, Denver, Colorado. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1954. Pp. 685. £6 13*s.* 6*d.*

Dr. Dublin has gone to great trouble to make this subject intelligible to the student of general pathology, and to this end the photographs have been prepared from paraffin-embedded material stained by hæmatoxylin and eosin.

The illustrations, though some are disappointing in quality, are well chosen and instructive, and the general medical reader is supplied with a profusion of photographs illustrating the gross pathology of the nervous system. The material is well arranged and the style lucid, and due regard is paid to clinicopathological correlation. Of particular value are the sections on allergic inflammation, tuberculosis, metabolic disorders, and tumours, for Dr. Dublin's critical approach to these subjects is stimulating, if at times a little unconventional. By including under the heading of metabolic disorders many conditions usually described as degenerative, he has narrowed the latter group considerably; and the remaining conditions in it he lists as "diseases of obscure ætiology." Genetic factors receive scant attention and so does the concept of abiotrophy. The technical section, too, is brief and far from complete, for Dr. Dublin seems to have little use for many well-tried methods (including the Nissl stain), and dismisses celloidin-embedding as being "not necessary for creditable work." The bibliography is extensive and valuable, though confined almost entirely to American publications.

The book may therefore be regarded as an up-to-date review of American work, but defective in its account of important European contributions.

Abnormal Psychology Glossary (Stanford: University Press. London: Oxford University Press. 1954. Pp. 24. 4*s.*).—This interesting and useful list of 668 definitions of technical terms used in psychology is intended for the "beginning student" about to attempt to master an introductory textbook. "Beyond that," says Prof. Calvin P. Stone, its author, "an unabridged or specialised dictionary is recommended." English students should beware of American spelling and such entries as "Argyll-Robertson pupil" and "Grave's disease." Most of the definitions are clear and concise, but it is hard to see why, in a restricted list, such entries as "morbid," "malinger," "latent," "insight," and "deterioration" are included: surely nobody beginning to study psychology can be ignorant of their meanings. Great Britain is represented by James Braid, Robert Burton, William Cullen, Henry Head, William Hogarth (because he depicted a scene at Bedlam in his *Rake's Progress*), Hughlings Jackson, William Tuke, and a few eponyms, whereas the U.S.A. are represented only by Benjamin Rush, Dorothea Dix, Clifford Beers, and Adolf (here wrongly spelt Adolph) Meyer (who was Swiss by birth).

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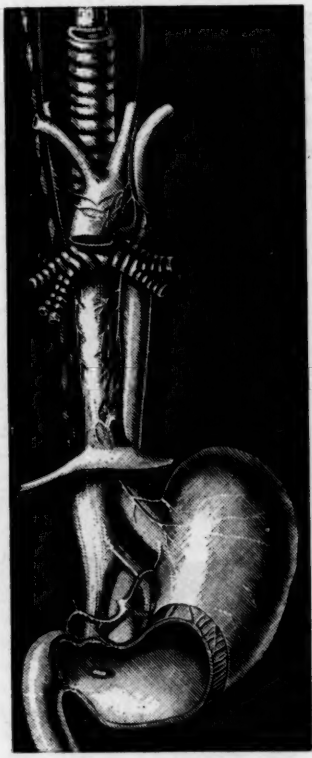

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THE LANCET

LONDON: SATURDAY, OCT. 9, 1954

Hospital Administration

IN the first five years of the National Health Service medical staffs were given little formal encouragement to advise on the medical policy of hospitals. But now medical staff committees have been officially recognised; and the committee of the Central Health Services Council which has been considering the internal administration of hospitals suggests means by which the authority of these committees may be strengthened.

The committee, whose main recommendations are summarised on p. 747, concludes that administration should depend on a tripartite partnership of medical, nursing, and lay branches. There must be willing coöperation, "springing from a consciousness of fellowship in a shared desire to serve," and based on three principles:

(1) That all administration must always be carried out within the general policy of the governing body.
(2) That because of the inevitable interaction of their duties, all who are doing administrative work must work together as a blended team.
(3) That neither a medical man nor a nurse should as a rule do work which a layman could do equally well.

More than half the evidence submitted to the committee concerned the long-standing issue of medical versus lay administration. The report remarks that the two types are not mutually exclusive: each has a proper sphere. But, it adds, the development of medical administration under the N.H.S. has been somewhat defective; and it suggests that on behalf of the medical committee a consultant engaged in clinical work should be appointed for a limited term as part-time medical administrator, to work in close association with the matron and the lay administrator. Such a proposal is likely to appeal to medical staffs, which usually include one or two with the talent, taste, and time for administration who would be willing to undertake this duty if it was recognised as equivalent to clinical work. In the past the medical superintendent has done much to hasten improvement in standards of care; and the proposed arrangement should yield equal benefit, while keeping the administrator in touch with his colleagues.

Having examined the relation of the matron to the governing body on the one hand and to the nursing staff on the other, the committee strongly recommends the establishment of committees that will include representatives of senior nursing staff. Senior nurses should have scope for initiative, which at present they are usually denied; and undoubtedly such committees, working sometimes in collaboration with medical staff—for example, on the training of nurses or on practical procedures—would greatly improve the esprit-de-corps and professional satisfaction of nurses. As head of one branch of the tripartite partnership, the matron would still deal directly with the governing body on all matters affecting nursing care; but the committee suggests that with regard to her non-professional dutes (e.g., supervision of housekeeping) she should be responsible in the first instance to the chief administrative officer. Such a reorientation would slightly curtail the power of the matron, but not her importance.

Turning to the lay administration in general hospitals, the committee emphasises the need at group level of a single chief administrative officer, through whom the governing body can see that its policy is carried out at all hospitals in the group. Concerning the conflict of interest between the group and the individual hospitals, the committee agrees with the view expressed by King Edward's Hospital Fund:

"Although the hospital group is envisaged as an entity of which the unit hospitals are parts and the policy of the group should be towards integration, in practice each individual hospital constitutes a corporate body with a morale of its own. This esprit de corps is an invaluable factor of efficiency and should be encouraged by the granting of a fair degree of local autonomy. There is no reason why this should conflict with the growth of a parallel group-mindedness."

For the economical development of resources the hospital group is the important unit. Yet sentiment and loyalty go, not to the group, but to the single hospital; and accordingly this should be given pride of place.

Rauwolfia Serpentina

THE ideal hypotensive agent would be potent, constant in action, and free from untoward side-effects. Recently it has been claimed that *Rauwolfia serpentina* may approach this standard. Rauwolfia has long been used in India for various diseases, and it has been studied pharmacologically.[1,2] Its chief clinical effects are sedative, and on the cardiovascular system, where it slows the heart-rate and induces mild hypotension. Side-effects are not severe; the most usual is drowsiness, but diarrhœa and itching have also been recorded.

So much is agreed. But has rauwolfia a place in the treatment of hypertension? VAKIL[3] claims that it has, and in reply to a postal questionnaire 46 out of 50 doctors in India agreed that it was of value.[4] There have since been other encouraging reports of its action.[5–7] But at least two important questions remain unanswered: first, what cases should be treated; and, secondly, how is the effect of the drug to be measured? It seems doubtful whether patients without symptoms and with a diastolic blood-pressure that is neither gross nor rapidly rising benefit from specific hypotensive therapy—the worry occasioned by repeated visits to doctors may outweigh any theoretical gain. Yet it is for these mild hypertensives that rauwolfia has been particularly recommended.[4,5,8] On the other hand, patients with severe hypertension that is giving rise to symptoms need treatment

1. Sen, G., Bose, K. *Indian med. World*, 1931, 2, 194.
2. Siddiqui, S., Siddiqui, R. H. *J. Indian chem. Soc.* 1931, 8, 667.
3. Vakil, R. J. *Med. Bull., Bombay*, 1940, 8, 495.
4. Vakil, R. J. *Brit. Heart J.* 1949, 11, 350.
5. Wilkins, W. R., Judson, W. S. *New Engl. J. Med.* 1953, 248, 48.
6. Doyle, A. E., Smirk, H. F. *Lancet*, 1954, 1, 1090.
7. Douthwaite, A. H. *Ibid*, p. 1345.
8. Livesay, W. R., Moyer, J. H., Miller, S. I. *J. Amer. med. Ass.* 1954, 155, 1027.

urgently. In an article on p. 726 of this issue Dr. VAKIL says of rauwolfia: "clinical results are often disappointing in malignant, nephrosclerotic, nephritic, and arteriosclerotic forms of hypertension"; and the results described by JOINER and KAUNTZE [9] confirm this. Certainly in some cases of severe hypertension rauwolfia has given real benefit [5 6]; but some of these results must be interpreted with care, and even with reserve. Sphygmomanometer readings—particularly of the diastolic level—are subjective measurements. Yet in many instances the clinical observer was aware of the treatment that the patient was receiving. Furthermore, although mean values of readings of diastolic and systolic pressures (and in some cases the mean blood-pressure) have been recorded before and after treatment, the figures have not been analysed statistically; and by recording only derived data most workers make such analysis impossible. Finally, so far no objective evidence of improvement in prognosis has been reported. The conviction of Dr. VAKIL and other responsible workers that rauwolfia deserves a place in treatment cannot be ignored; but their observations do not excuse us from seeking objective proof.

In *Rauwolfia serpentina* we apparently have a safe drug with a mild hypotensive effect; but its value in treatment has still to be defined.

Anticoagulants

AT the International Conference on Thrombosis held at Basle in July and in recent published reports, two topics have been much discussed. One is the practicability and the value of long-term treatment of outpatients with anticoagulants; the other is the constantly increasing number of anticoagulant drugs.

At Basle OWREN,[10] of Oslo, discussed his results with long-term anticoagulant treatment of coronary-artery disease. The short-term treatment of acute myocardial infarction with anticoagulants has now been very extensively applied and the results voluminously reported; it is generally agreed that this treatment reduces the death-rate, principally by minimising the secondary thrombo-embolic complications. OWREN pointed out, however, that myocardial damage from coronary thrombosis is irreversible, and in this sense anticoagulant treatment is too late. He suggested that it is more reasonable to treat patients known to have coronary-artery disease prophylactically by continuous administration of dicoumarol or other anticoagulant drug. Since 1948 OWREN himself has treated in this way about 700 patients. From this group he selected for particular study 236 with coronary-artery disease, half of whom had had one infarction before treatment was begun. These patients all received dicoumarol; but recently OWREN and his colleagues have preferred phenylindanedione, which they find gives smoother control. They control dosage, not by the popular Quick one-stage prothrombin-time, but by a method of their own which they consider takes account of changes in prothrombin and in proconvertin (factor VII). Intermittent dosage and daily maintenance dosage were both tried; and for this long-term therapy control was more complete with the latter method. It is not easy to decide the correct dose, since individual responses to dicoumarol vary greatly both in duration and in intensity. In order to establish the right scale of dose, the prothrombin-proconvertin level of the blood was checked on alternate days for the first eight to fourteen days; when a proper and stable level of hypocoagulability had been reached, the interval between blood tests was lengthened to one week, then to two weeks, and finally to three weeks. A chart is kept for each patient to show the trend of the test results, and the dose is adjusted a few milligrammes up or down according to the rise or fall of the test results. The average initial dose of dicoumarol is 240 mg. on the first day, 120 mg. on the second day, then 100–50 mg. daily according to the result of the blood test. Patients' needs vary from time to time, and stability can never be taken for granted.

OWREN described the results in 128 patients who had angina pectoris without infarction; 56 had been treated for up to one year, 41 for one to two years, 22 for two to three years, and 9 for three to five years. Myocardial infarction occurred during treatment in 10 patients (in 6 cases during the first year), and 8 of the 10 died. A second group consisted of 108 patients who had survived their first myocardial infarction for up to five years; 7 of these patients had a further infarction, and 6 of these died. The mortality in OWREN's cases of angina pectoris was less than 5% in the first year, and this compares favourably with known statistics on the prognosis of angina not treated with anticoagulants. Most of the patients, both with and without myocardial infarction, stated that they were much better on anticoagulant treatment. OWREN records, rather ominously, that patients who stop anticoagulant treatment for any reason are very liable to have a fatal infarction quite soon. NICHOL et al.[11] have noted the same effect; of 110 patients who stopped anticoagulant treatment for coronary disease after one to eighty-two months, 34 died from infarction, most of them within six months.

TULLOCH and IRVING WRIGHT [12] have recorded experience with 227 outpatients who had prolonged outpatient anticoagulant treatment. The biggest group (117) were suffering from thrombophlebitis; 38 had rheumatic heart-disease with embolic complications; and 32 had myocardial infarction or ischæmia. Most of the patients had been treated for up to one year. Some patients were treated with dicoumarol and some with ethyl biscoumacetate, and their experience suggests that dicoumarol is the better drug for long-term use. The doses were controlled by the Quick prothrombin-time method; at first tests were needed up to three times weekly, then after stabilisation the patients attended weekly and a few fortnightly for tests. Of the 32 patients with myocardial disease 2 had fresh infarcts during treatment; of the 117 with thrombophlebitis only 7 developed fresh lesions while under treatment. No fewer than 70 patients had hæmorrhagic complications at some time, hæmaturia being one of the commonest; lowering of the dose or temporary discontinuation of the anticoagulant checked these complications

9. Joiner, C. L., Kauntze, R. *Lancet*, 1954, i, 1097.
10. Owren, P. *Schweiz. med. Wschr.* 1954, **84**, 822.
11. Nichol, E. S., Phillips, W. C., Jenkins, V. E. *Med. Clin. N. Amer.* 1954, **38**, 399.
12. Tulloch, J., Wright, I. S. *Circulation*, 1954, **9**, 823.

in all except 11 cases; these were treated with vitamin K or vitamin K_1, and 2 needed blood-transfusion. TULLOCH and WRIGHT conclude that, provided proper laboratory facilities are available, treatment of outpatients with anticoagulants is fairly safe and lessens the incidence of thrombo-embolic episodes.

SHAPIRO,[13] of New York, still regards the intermittent dosage as better for prolonged anticoagulant treatment, because hæmorrhagic complications seem to be less than with the daily maintenance doses. This may be because prolonged hypoprothrombinæmia damages factors that maintain the integrity of the vessel walls. A drug with a reasonably long action must be used, such as dicoumarol, cyclocoumarol, or 'Warfarin Sodium' which is especially useful since repeated doses can be relied on to produce much the same effect. By this method the initial dose is that which will prolong the prothrombin-time by two to two and a half times, and a further dose is not given until the prothrombin-time begins to rise again. For outpatients the disadvantage of the method seems to be that frequent prothrombin estimations are needed.

Warfarin is one of the coumarin derivatives synthesised by LINK and his associates. The sodium salt can be given intravenously in a dose of 1 mg. per kg. body-weight; but it does not act particularly quickly by this route,[14] so CLATANOFF et al.[15] administer it by mouth. Given this way warfarin acts about as quickly as ethyl biscoumacetate and therapeutic prothrombin levels are reached within twenty-four hours. But the action of warfarin is as long as that of dicoumarol; it also has a high potency for a drug of this type, so the dose at any one time should not exceed 75 mg. Maintenance doses of 12·5–25 mg. produce a steady level of prothrombin, but frequent prothrombin estimations to control the dosage are no less necessary than with other anticoagulants. Its action is easily stopped by vitamin K_1.

'*Dipaxin*,' a variant of phenylindanedione (it is 2-diphenylacetyl-1, 3 indanedione) is a relatively long-acting anticoagulant. PASCALE and OLWIN[16] treated 80 patients with this drug. They found that the prothrombin level is lowered to therapeutic levels in about forty hours, but the prothrombin remains depressed for as long as fifteen to twenty days. Dipaxin is a potent drug; the initial dose is only 20–25 mg., and the maintenance dosage—dictated by the prothrombin level—is up to 7 mg. daily. With this drug the prothrombin level can be kept very even. If, for any reason, the prothrombin level must be raised quickly, the drug's action can be rapidly neutralised by vitamin K_1. Bleeding episodes occurred in 2% of the cases reported by PASCALE and OLWIN; but in only 1 could the bleeding be definitely attributed to the low prothrombin level. Dipaxin may prove suitable for outpatients.

Long-term treatment of thrombo-embolic diseases with anticoagulants is so far practised only by a few enthusiasts. Better and more stable anticoagulant drugs are now available; but, because of the uncontrollable factors of individual variations in response to a given dose, and of varying response at different times in any one patient, regular control by estimation of the blood-prothrombin level is still essential. Thus outpatient clinics must be organised in conjunction with a service for taking blood and for estimating prothrombin levels in a reasonably short time; most patients will have to attend weekly and few less often than fortnightly. Clinics involving close laboratory control are, of course, already common—for example, those dealing with the treatment of diabetes or of leukæmia. Yet another laboratory service for outpatients would strain resources; and before this is supplied those concerned will have to be convinced that the effort is worth while. Here lies the difficulty; for we are still not certain that every patient with angina pectoris needs to be kept on anticoagulant therapy for the rest of his life; nor is there agreement on how long anticoagulant treatment should be continued in a patient who has had a myocardial infarct. Long-term anticoagulant therapy is not free of risks, one of which seems to be undue liability to further thrombo-embolic episodes if treatment is stopped. Are these risks slighter than the risk of recurrence in the natural course of the disease? OWREN and IRVING WRIGHT think that such treatment *is* worth while; and we should be grateful to them for the years of effort that they have already put into their studies. But we should not be surprised if most physicians still feel doubtful about long-term anticoagulant treatment, except for patients who have a condition, such as thrombophlebitis migrans, in which its use is clearly indicated.

13. Shapiro, S. *Schweiz. med. Wschr.* 1954, **84**, 830.
14. Wolff, J. M., Barker, N. W., Gifford, R. W., Mann, F. D. *Proc. Mayo Clin.* 1953, **28**, 489.
15. Clatanoff, D. V., Triggs, P. O., Meyer, O. O. *Arch. intern. Med.* 1954, **94**, 213.
16. Pascale, L. R., Olwin, J. H. *Circulation*, 1954, **9**, 230.

Annotations

NUMBERS OF MAN AND ANIMALS

IT needs no great insight to see that some of the most serious political, social, and medical problems of the next fifty years will be due to the present explosive growth in the numbers of mankind. Last month this subject was discussed in Rome at an international conference organised by the United Nations; and on Sept. 24 and 25 the Institute of Biology held in London a conference at which animal ecologists, demographers, economists, and doctors exchanged views on the same topic.

At this conference Mr. D. Lack, SC.D., F.R.S., of the Institute of Ornithology at Oxford, held that in animal populations the limiting factor was usually food-supply. Predators, disease, and any effect of density on fertility played only a secondary part. He asked what was the main cause of mortality in man in under-developed countries—was it food deficiency or disease?—but received no clear answer.

The essential figures for the growth of world population were graphically described by Mr. A. S. Parkes, D.SC., F.R.S.: in 1800, the population was 906 million; in 1850 1171 million; in 1900, 1608 million; in 1950, close on 2500 million. Extrapolation of these figures gives a total in A.D. 2100 of no less than 10,000 million—an average of 200 to the square mile, including Antarctica, the Sahara, and the like. The cause of this astonishing rise is clear enough. It is due to a fall in the death-rate without a corresponding fall in the birth-rate. Prof. A. L. Banks described how in Western Europe the fall in the death-rate was slow. In England it fell from 22·9 per 1000 in 1870 to 11·3 in 1952. The fall in deaths has now been balanced by a fall in births, and the English population may soon reach something like equilibrium. But the fall in mortality that took a century in England may now occupy less than a tenth of that time in other countries. Professor Banks cited the figures for Ceylon, where mortality in 1945 was 22·0 but in 1948 only 13·2.

Where a sharp rise in population follows a steep fall in mortality, the answer to Dr. Lack's question is clearly that disease has been the limiting factor. But for how long

will this be so? Can a population of 4000 million—or even perhaps nearly 6000 million by the end of the century—be fed? Lord Boyd-Orr, F.R.S., held that technically this was feasible, but he doubted whether mankind had the collective wisdom to put the technical knowledge into effect. Dr. Parkes also held that modern advances in food production would not be applied in time. What then is to be done to prevent the rise in population being checked by famine, perhaps accompanied by pestilence and war? Professor Banks courageously suggested that it was a mistake for international authorities dealing with under-developed countries to pay attention to disease control at any price. Rather they should follow the historical pattern of development in Western Europe, introducing first clean water-supplies and good sanitary systems, then personal and domestic hygiene and the elementary principles of sound nutrition. Further action should be taken only at a people's own request and with their active participation. This might not bring about the same dramatic fall in mortality as a direct attack on disease, but it would allow time for the birth-rate to fall too and might contribute more to the happiness of the population.

It is perhaps unrealistic to expect health authorities to refrain from wiping out such diseases as malaria, even though this has not been requested by the population. Possibly the best hope of preventing limitation of population by lack of food is by spreading Western ideas on family planning as fast as Western techniques of disease control. Mr. E. Grebenik cited a report, given at the Rome Conference, of Japanese villages in which the birth-rate had been reduced from 38·3 to 16·1 in only four years, by disseminating knowledge of birth-control. Japan, however, is already very much westernised. Lord Boyd-Orr, though welcoming the efforts of such bodies as the International Planned Parenthood Federation, thought that it would be a very slow business to get the idea of family planning widespread in under-developed countries. Dr. Parkes, too, held that present methods were unsuitable for such peoples and that some simple biological methods must be developed. Unfortunately neither plant extracts, such as those of *Lithospermum ruderale*, which suppress œstrus, nor the anti-hyaluronidases, which prevent fertilisation, had yet proved suitable. Further research was urgently needed. The medical profession, which had created the problem of rapid expansion, had a responsibility to solve it.

TOMOGRAPHY IN BONE DISEASE

THE nature and extent of disease in bone can usually be demonstrated merely by taking good films in two planes at right-angles. Occasionally special projections in particular planes may help if detail is obscured by overlying structures: for example, a tangential view of the knee-joint will show the posterior surface of the patella. In recent years increasing use has been made of contrast media, such as air and diodone, in the evaluation of lesions of joints, and in the demonstration of sinus tracks. Where there is considerable depth of bone, or where soft tissue or a plaster cast obscures the bone shadow, tomography can sometimes help.

Walker and Hanafee [1] have recorded their experience of planography in the demonstration of sequestra in 22 cases of chronic osteomyelitis. In 9 of these cases, a sequestrum was displayed by tomography, although it could not be seen on plain films. Each sequestrum appeared as a dense area surrounded by a clear halo; it persisted in successive tomographic cuts which thus differentiated it from a small bony peninsula. In one case the sequestrum turned out to be a considerable distance from the expected site. Walker and Hanafee were able to distinguish reorganised bone-graft chips from a true sequestrum in a case of osteomyelitis of 35 years' duration. In a patient with Charcot's disease, where a sinugram had failed to show any communication between the capsule of the hip-joint and a subfascial abscess of the thigh, tomograms revealed a large sequestrum, consisting of the subarticular cortex of the femoral head.

Tomography is also useful in the examination of the spine, where it can sometimes demonstrate secondary deposits earlier than is possible by straight radiography.

1. Walker, O. R., Hanafee, W. N. *J. Bone Jt Surg.* 1954, **36A**, 750.

INTRACRANIAL GLIOMATA

A Medical Research Council report by Penman and Smith [1] reviews 298 histologically proved cases of intracranial gliomata from the records of the neurosurgical department of St. George's Hospital. This volume, which clearly enshrines a lot of hard work, on the whole vindicates clinical lore. Thus in this series medulloblastomas are almost confined to the first two years of life; and astrocytomas are a hazard of all adult life, while glioblastomas show a peak in the sixth decade, which seems to support the view that those last two are a separate pathological entity. The cases in early and middle adult life included slightly more males than females; but it is perhaps questionable whether this warrants the suggestion of "a high concentration of male sex hormones acting only after a latent period of about 10 years" as an ætiological factor. The tumours were found more commonly in the left than in the right hemisphere; and "the evolution of speech and handedness may somehow have made the major hemisphere more liable to neoplasia." As regards diagnosis, headaches, papilloedema, and vomiting are again shown to be reliable guides; but epilepsy was "the symptom which most frequently preceded all others" in the series. It is a tribute to the standard of diagnostic radiography that of 247 cases in which ventriculography was done 243 were recognised as abnormal. So far as final prognosis is concerned, site and type of tumour are apparently more important than type of treatment. In this series radiotherapy was always given in conjunction with surgery, so separate assessment of these two methods was impossible.

1. Intracranial Gliomata. By JOHN PENMAN and MARION C. SMITH. *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 284. H.M. Stationery Office, 1954. Pp. 70. 5s.

INSECTICIDAL LACQUER

ATTEMPTS to prolong the effectiveness of residual insecticides by mixing them in paints have usually met with only indifferent success, since most of the toxicant is "locked up" in the thickness of the paint.[2] Now, however, Block [3] has got round this difficulty by dissolving dicophane (D.D.T.) and other compounds in various varnishes and resins to form super-saturated films. When mechanically stimulated the insecticide crystallises in the varnish medium, and a fine "bloom" of crystals appears on the surface. If these are wiped off, a fresh crop of crystals grows out in a day or so. One of the most promising substances used in this way was a urea-formaldehyde resin mixed with plasticiser. Bracey [4] has shown that the rate of crystallisation and the effectiveness of the preparation depend on the hardness of the film; and this can be controlled by using the right amount of plasticiser and an acid accelerator, instead of stove-hardening the resin.

The process has been extensively tested in this country, with encouraging results.[5,6] Cockroach-infested galleys of merchant ships were treated with resins containing dicophane, gamma benzene hexachloride, aldrin, or

2. Barnes, S. *J. Oil Col. Chem. Ass.* 1945, **28**, 181.
3. Block, S. S. *Soap, N.Y.* 1948, **24**, (2) 138, (3) 151, (4) 155.
4. Bracey, P. Insecticides: report by W.H.O. expert committee. H.M. Stationery Office, 1953.
5. Hitchon, J. L., Price, M. *Shipb. Shipp. Rec.* 1954, p. 407.
6. Mackie, T. L. *Sanitarian, Lond.* 1953, **62**, 122.

dieldrin ; of these, dieldrin seems to be the most effective. Several heavily infested ships remained almost free from cockroaches for nearly two years after a single treatment, despite regular voyages through the tropics.

This new technique might usefully be applied to hospital kitchens, which are always prone to infestation by cockroaches and Pharaoh's ant. The old method of using insect powder is seldom really effective ; the application of powder, which to be continually repeated, involves unsightly residues. Wall-spraying is little better, and its value is greatly diminished by cleansing measures. The new lacquer is almost invisible, and the tiled or painted surface of the average institution kitchen makes an ideal base. Cleansing of the walls does not destroy its effectiveness, for if the surface " bloom " of insecticide is removed a new crop of crystals is extruded. The lacquer has to be applied by experts ; and the cost is high, though perhaps not excessive in view of the long-term benefit. Treatment of a large hospital kitchen would cost about £50 ; of a ward kitchen about £5.

This method has been tested mostly against cockroaches, which are particularly difficult to control ; it is effective also against many other insect pests, including mosquitoes, houseflies, and bedbugs.

SERUM-IRON IN LIVER DISEASE

THE liver is the largest storehouse of iron in the body. In the healthy organ most of the iron is probably in a combined organic form, since only traces are revealed by the highly sensitive prussian-blue reaction with potassium ferrocyanide. In some hepatic diseases, or if the iron intake is great (e.g., after multiple blood-transfusions), these deposits increase enormously, and the liver becomes rusty brown in colour ; and an excess of iron may be found in the serum in the ferric form combined with a beta-globulin.

Study of the serum-iron has hitherto been impeded by the lack of a simple and reliable method of estimation ; but the colorimetric method, based on the reaction between ferrous iron and orthophenanthroline,[1] may soon become a routine laboratory procedure especially useful in investigating anæmia and hepatic disease. Christian,[2] at the Veterans Administration Hospital in New Orleans, has reported 659 estimations on 313 persons, of whom 193 had liver disease. The most significant finding was the clear elevation of the serum-iron level in infective hepatitis. In 50 healthy controls the mean level was 143 μg. per 100 ml., with a range of 70–286 μg. per 100 ml. ; whereas in 33 patients with virus hepatitis the mean level was 197 μg. per 100 ml., with a range of 178–571 μg. per 100 ml. Other hepatic diseases studied were portal cirrhosis, fatty metamorphosis, extrahepatic biliary obstruction, passive congestion, and hæmochromatosis. Except in hæmochromatosis the serum-level iron levels rarely reached those found in infective hepatitis. In the average case of infective hepatitis the level gradually rises in the first two weeks. A high level persists more or less unchanged from the third to about the eighth week, and the level then gradually returns to normal in the following month. No close relation could be established between the level and the extent of parenchymal damage or the degree of bilirubinæmia. In 14 patients with extrahepatic biliary obstruction the mean serum-iron level was only 137 μg. per 100 ml. This low value agrees with the findings of Ducci et al.[3], who concluded from their estimations that a value of more than 300 μg. per 100 ml. was strong evidence against posthepatic jaundice. These workers also reported considerably raised values in infective hepatitis.

1. Barkan, G., Walker, B. S. *J. biol. Chem.* 1940, **135**, 37.
2. Christian, E. R. *Arch. intern. med.* 1954, **94**, 22.
3. Ducci, H., Spoerer, A., Katz, R. *Gastroenterology*, 1952, **22**, 52.

Thus serum-iron levels would seem to be of value in differential diagnosis. A level of 300 μg. or more in a jaundiced patient is strong evidence against extra-hepatic obstruction. The only exception in Christian's series was a case in which there was unequivocal hæmolysis in the course of obstructive jaundice. Unfortunately the reverse does not hold : many cases of infective hepatitis have serum levels below 300 μg. per 100 ml. But in such cases the rise in serum levels revealed by successive estimations may prove a useful diagnostic pointer.

PROGNOSIS IN BRONCHIAL CARCINOMA

FOLLOW-UP studies of cases of bronchial carcinoma give depressing results. Ehler et al.,[1] for instance, report that of 220 patients admitted to a general hospital only 5 were alive at the end of five years. 196 of the patients were treated medically, and of these only 1 survived ; the other 4 survivors were from a group of 24 patients in whom pulmonary resection was done.

This series illustrates the deadliness of anaplastic carcinoma. In the whole series this was only slightly less prevalent than squamous carcinoma ; but no patient with this type of neoplasm was alive at the end of the five-year period. Of the 5 survivors 3 had squamous carcinomas, and 2 adenocarcinomas. Fortunately, squamous carcinoma, which is the commonest type, tends to cause bronchial blockage early, so local symptoms and signs may draw attention to the tumour before it has spread. Even so, the proportion of cases suitable for resection is still small ; over a seventeen-year period Ehler et al. found that 70% of cases were beyond the scope of surgery when first seen, and there was no evidence that the proportion of operable cases was increasing. Although radiographic surveys were common in the area served by their hospital, only very few cases were revealed by this means ; and patients with tumours which were not yet causing any symptoms were reluctant to submit to investigations that might possibly include thoracotomy.

ERYSIPELOID

IT was by no accident that " erythema serpens " was first described by Morrant Baker in the great hospital adjacent to Smithfield. *Erysipelothrix rhusiopathiæ*, though it causes swine erysipelas, also lives as a peaceful commensal in the gut of pigs and other stock. Slaughterers, butchers, and others handling meat are therefore exposed to the risk of infection from perfectly healthy, but contaminated, carcases. Erysipeloid contracted from fish is a little more mysterious ; for, although *E. rhusiopathiæ* has been cultured from fish slime, Stuart [2] has been unable to recover it from sea-fresh fish preserved aseptically, and the organism is not known to cause disease in fish.

Proctor and Richardson [3] observed 235 cases of erysipeloid in Aberdeen fish-market workers. They had reason to believe that the infection was much less common in trawlermen, although they directly handled the fish to a similar or greater extent. Some of their cases were in people who had not been in direct contact with fish, but had handled fish-boxes or, in one case, had touched a vehicle used for transporting fish-market employees. They therefore agree that the source of infection is fish slime and scales, which presumably form a suitable culture medium for the organism.

This study also confirmed the impression that the incidence of the disease varies with the season. Gilchrist's

1. Ehler, A., Stranahan, A., Olson, K. B. *New Engl. J. Med.* 1954, **251**, 207.
2. Stuart, E. Cited by D. M. Proctor and I. M. Richardson (footnote 3).
3. Proctor, D. M., Richardson, I. M. *Brit. J. industr. Med.* 1954, **11**, 175.

323 cases of erysipeloid contracted from Chesapeake Bay crabs occurred between June and the end of September. Klauder's 1000 cases in fishermen of the North-East American seaboard arose between May and September, and he noted a sharp decline in incidence when the temperature of the sea fell from 67°–70° to 62°F. The Aberdeen cases arose almost exclusively between June and September, and the incidence was closely correlated with the mean weekly air-temperature. Proctor and Richardson suggest that atmospheric temperature is in some way related to the biological activity of the organism. Swine erysipelas is also commonest in the summer and early autumn; and possibly this is due to a similar cause—namely, a rise in temperature which enhances the saprophytic growth of the organism in the soil.

A BARBITURATE ANTAGONIST

THE synthesis of nalorphine (*N*-allylnormorphine) and the demonstration of its pharmacological antagonism to morphine and other alkaloids of opium [1–4] provided the clinician with a valuable weapon against opiate narcosis. Nalorphine has proved effective against poisoning due, not only to the opium alkaloids, but also to pethidine,[5] methadone,[6] racemorphan,[7] and other synthetic analgesic drugs which differ from morphine in chemical structure but resemble it in their pharmacological actions. Nalorphine is a specific antagonist of these drugs; and does not act against coma due, for example, to barbiturate poisoning. Thus while nalorphine is of pharmacological interest and has proved its value in many emergencies, the clinician does not need its aid very often.

Barbiturate poisoning, on the other hand, has become an all too common medical emergency.[8] Hitherto the treatment of this condition has consisted mainly in the administration of cortical and medullary stimulants such as picrotoxin, nikethamide, caffeine, and more recently amphetamine [9] and methylamphetamine.[10] Such treatment has not met with universal approval, and the view has been expressed [11] that in most cases when these drugs were used the clinician was not treating barbiturate intoxication but rather measuring the maximum tolerance of the human body for convulsants. Whatever the arguments, the claim of workers in Australia [12] to have prepared a true barbiturate antagonist will be received with interest. This substance is β, β-methyl-ethyl glutarimide. As yet there is little information about its pharmacology; but it has been successfully used, together with a morphine antagonist, 2-4-diamino-5-phenyl thiazole, prepared by the same workers,[13] in 20 cases of barbiturate poisoning. It is not encouraging to read [12] that the glutarimide in a dosage of 30 mg. per kg. body-weight caused fatal convulsions in rats and mice, whereas 100 mg. per kg. was necessary to reduce by half the sleeping time after intraperitoneal injection of pentobarbitone; but experimental results do not necessarily apply directly to man. A clinical report [14] is to follow.

1. Hart, E. R. *J. Pharmacol.* 1941, **72**, 19.
2. Hart, E. R., McCawley, E. L. *Ibid*, 1944, **82**, 339.
3. McCawley, E. L., Hart, E. R., Marsh, D. *J. Amer. chem. Soc.* 1941, **63**, 314.
4. Unna, K. *J. Pharmacol.* 1943, **79**, 27.
5. Eckenkoff, J. E., Elder, J. D., King, B. D. *Amer. J. med. Sci.* 1952, **223**, 191.
6. Fraser, H. F., Wikler, A., Eisenman, A. J., Isbell, H. *J. Amer. med. Ass.* 1952, **148**, 1205.
7. Domino, E. F., Pelikan, E. W., Traût, E. F. *Ibid*, 1953, **153**, 26.
8. See *Lancet*, July 10, 1954, p. 75.
9. Nabarro, J. D. N. *Brit. med. J.* 1950, ii, 924.
10. Hugues, J., Lecomte, J. *Rev. méd. Liège*, 1954, **9**, 235.
11. Locket, S., Angus, J. *Lancet*, 1952, i, 580.
12. Shaw, F. H., Simon, S. E., Cass, N., Shulman, A., Anstee, J. R. Nelson, E. R. *Nature, Lond.* 1954, **174**, 402.
13. Shaw, F. H., Bentley, G. *Ibid*, 1952, **169**, 712.
14. Shaw, F. H., Shulman, A., Cass, N., Whyte, M. H. *Med. J. Aust.* (in the press).

CEREBRAL PALSY

PATIENTS with cerebral palsy rarely have only one defect, or even one kind of defect; spasticity of a limb is usually associated with rigidity, flaccidity, or involuntary movement elsewhere. Experience and great patience are needed for clinical assessment, on which depends a reasoned programme of treatment, so that the patient may have all the function of which his damaged brain is capable. These tasks were discussed at a conference of the British Council for the Welfare of Spastics, held in London on Sept. 28–30.

The success of workers in this field is, on occasion, dramatic—as when a patient unable to speak, with little voluntary movement of any limb, and with severe athetosis is enabled to communicate with the rest of the world by means of a typewriter; or when a child with no voluntary movement of his legs is enabled to walk unaided. Even more impressive are some of the successes in patients who first come under treatment as adults. Here little natural improvement can be looked for; but with treatment patients may walk and do useful work. With the improvement in physical function comes an even more striking improvement in mental ability and emotional adjustment. Examples of such cases were described at the conference, where workers from many centres shared their experience.

Cells of the central nervous system, if severely damaged, do not regenerate. This observation has for many years governed thinking on the problems of the care of patients with physical damage to their brains. They could be taught how to use what function was left, but that was all. Now, Dr. Fay [1] suggests that there are reflex patterns, relics of man's phylogeny, dormant in the normal brain. These patterns are operated by areas low in the brain-stem which usually are undamaged in the patient who survives. Dr. Fay suggests that these patterns can be brought to the surface, and made to do useful work for the paralysed patient. Further advances are likely to come mostly from controlled studies, of which Mr. Wylie McKissock described a fine example. It seemed that removal of the damaged cerebral hemisphere in a patient with juvenile hemiplegia and severe epilepsy should check the epilepsy without materially worsening the hemiplegia. The operation was reported from South Africa to have proved successful.[2] Accordingly in this country a group of patients was selected who without operation would need institutional treatment indefinitely, because of frequent and uncontrollable fits and emotional storms which overshadowed the physical disability. Half of this group were operated on; and the results exceeded expectations. In almost all the fits were abolished, and the personality became much more stable.

THE Royal Cancer Hospital, London, has been re-named the Royal Marsden Hospital.

Dr. W. P. H. SHELDON has been appointed to fill the vacancy on the Clinical Research Board caused by the death of Sir James Spence.

1. Fay, T. *J. Amer. med. Ass.* 1953, **152**, 1623; *Ibid*, 1954, **155**, 729; *Cerebral Palsy Rev.* Jan.–Feb. 1953.
2. Krynauw, R. A. *S. Afr. med. J.* 1950, **24**, 539.

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Special Articles

INTERNAL ADMINISTRATION OF *HOSPITALS*

In March, 1950, the Central Health Services Council appointed a committee to examine methods of hospital administration, and the committee, which met under the chairmanship of Alderman A. F. Bradbeer, has now made its report.[1] Its terms of reference were:

"To consider and report on the existing methods of administration in individual hospitals, *and within Hospital Management Committee groups*, with particular reference to: *(i) matters of finance, staff and supplies; (ii) the extent to* which differences in the work undertaken at different hospitals call for differences in their administrative organisation; *(iii) the extent to which administrative duties should be* undertaken by medical and nursing staff."

The words in italics were added to the original terms of reference when it became clear that their absence would prevent the committee from "considering many—perhaps most—of what were emerging as the most important and difficult questions in hospital administration today." The report is discussed in a leading article in this issue, and there follows here a summary of some of the committee's principal recommendations.

MEDICAL ADMINISTRATION IN GENERAL HOSPITALS

There is need to strengthen the medical committee system, both at hospital and group level. Every hospital should have a medical staff committee, constituted by the medical staff themselves. Its constitution will vary according to the type of hospital to which it belongs. The committee's advice should be sought on matters of general hospital policy and development and on all questions within the content of medical administration.

Detailed day-to-day work of medical administration may satisfactorily be undertaken in the smaller general (and in some larger) hospitals by or under the control of the chairman of the medical staff committee.

An alternative, applicable in most larger hospitals, is to appoint as medical administrator a consultant combining clinical with administrative duties and working in close association with the matron and lay administration. His administrative work is clinical in its essence and he should therefore not suffer financially, whatever proportion of his time may be devoted to medical administration. He should normally be selected from among the existing consultants by the medical staff committee and the hospital management committee jointly with representatives of the regional board. If he is appointed by the board from outside the hospital, representation of the management committee on the advisory appointments committee should be augmented.

A new R.M.O./R.S.O. grade, to combine clinical with medical administrative work, and to ensure reasonable prospects of promotion to consultant rank for either clinical or administrative and clinical work, should be created to bring balance and continuity to medical administration under the National Health Service.

There are insufficient grounds for recommending the introduction of group medical superintendents.

Medical administration at group level can best be carried out by a medical advisory committee having functions of the kind described in the Ministry's memorandum on Medical Committees in Hospitals and Hospital Groups.[2] In addition, the committee's constitution should be acceptable to the governing body, and the chairmen of the committee (who should be elected for three-yearly periods) might have control over emergency admissions.

Adoption of the North American "chiefs of service" system in English hospitals would not solve problems of medical staffing and coördination; nor should any uniform pattern of administration be imposed on the hospital service. Encouragement should, however, be given to experiments in the organisation of specialties and groups of specialties under the administrative charge of named consultants acting *in coöperation with the approved group medical administrative* machinery.

MENTAL HOSPITALS

The special nature and duties of mental hospitals demand concentration of a considerable degree of authority in the hands of the medical superintendent.

Model standing orders for the general government of mental and mental-deficiency hospitals and defining the functions of the medical superintendent should be prepared and circulated to hospital authorities for their guidance.

In major mental or mental-deficiency hospitals, problems of "patient management" are too complex to be effectively handled by a lay officer on medical advice, and require the services of a resident psychiatrist of consultant status.

Measures should be taken to give Hospital Management Committees a more effective voice in appointing medical superintendents. There are insufficient inducements to attract adequate numbers of experienced medical men to the post of medical superintendent in mental and mental-deficiency hospitals.

Medical staff committees, on the lines recommended for general hospitals, should be set up in all mental and mental-deficiency hospitals.

NURSING ADMINISTRATION

The matron should be regarded in her capacity as head of the nursing services as directly responsible to the governing body of the group and should have the right of direct access to it. In her non-professional functions, however, she should be responsible to the chief administrative officer in the first instance rather than to the governing body direct.

The matron should not be regarded as having responsibilities in respect of the nurse-training school to anyone other than the governing body. In each nurse-training school there should be a nursing education committee to assist the matron.

Group nursing advisory committees should be established in every group to give the governing body the collective advice of the senior nursing staff. A matron should be chosen as spokesman to advise directly on group nursing policy. There should be in every hospital a nursing staff committee, constituted by the nurses themselves and consisting of representatives of all qualified nurses in the hospital.

LAY ADMINISTRATION

All principal specialist officers at group level should be responsible to the governing body through the chief administrative officer. The combination of senior administrative posts is in principle undesirable but some degree of combination may often be appropriate to avoid over-elaboration of administrative appointments. The combination of group secretary and finance officer, or of finance and supplies work, in one officer, and the secretaryship in another, are generally unsatisfactory.

The unit hospital administrator should generally be regarded as the senior lay officer of his hospital and responsible for its lay administration.

Further experiments should be undertaken in the combination of groups for central contracting for supplies. The lack of sufficient evidence on the details of supplies organisation calls for a closer investigation into the whole field of supplies.

THE COMMITTEE SYSTEM

Standing committees should be set up only where there is regular work for them to do. Power should not be delegated to committees to take executive decisions. Measures should be taken to secure integration between the work of different committees.

House committees perform most useful work in the field of public relations and patient welfare. They should not, however, be given direct power to spend Exchequer money. Their powers in relation to the engagement and discharge of staff should be limited to making recommendations.

1. Ministry of Health: Central Health Services Council. Report of the Committee on the Internal Administration of Hospitals. H.M. Stationery Office. Pp. 87. 3*s*.
2. R.H.B.(53)91/H.M.C.(53)85/B.G.(53)87.

The Wider World

RUSSIA REVISITED

Impressions of Soviet Medicine

T. F. Fox
M.A., M.D. Camb., F.R.C.P.

WHEN I first went to the U.S.S.R., in 1936, Soviet doctors were still contending with stupendous difficulties and had little to tell us about advances in the technique of medicine. What was chiefly remarkable about their work was the vigour with which comparatively elementary knowledge, which every country had long possessed, was being applied and distributed.[1] As soon as medical care ceased to be a commodity on sale for a fee, the resources of medicine could be reallocated to the better advantage of the community as a whole, with more emphasis on prevention.

Now that we in Great Britain likewise offer medical care to our entire population, and have our own experience of medical planning, the Russian health services seem less exciting than they did eighteen years ago; but it would nevertheless be instructive to know how they are developing and especially how they differ from our own. Moreover, now that the Soviet Union has transformed itself, with unexampled speed, into one of the foremost industrial nations, one may reasonably expect Soviet laboratories to make substantial new contributions to the common stock of medical knowledge. Opinions will long differ on the fundamental question whether medical practice and medical science can reach their full stature under an authoritarian régime, but unquestionably such a régime is capable of promoting rapid growth up to a certain point.

The basic structure of the Soviet health services has been fully if uncritically described by Sigerist,[2] and their shortcomings have been set out, with equal though opposite partiality, by Lazarévitch,[3] whose indictment of Soviet medicine is based on quotations from official directives and from articles and letters in the Soviet press. Having spent only three weeks in Russia, as one of a party entertained there last month by the Soviet ministry of health,[4] I can do little more than guess at the true merits and defects of these services; but it may be worth setting down some of the information we collected. Starting with the practice of medicine, I shall pass on to its academic side, and conclude with more general comment.

On each of the subjects treated, some other member of our party could speak with more knowledge. Furthermore, we often went to different places—and even took different views. I should add, too, that I know no Russian and am exposing the reader to all the hazards of misreported translation.

1. *Lancet*, 1936, ii, 328, 393, 450.
2. Sigerist, H. E. Medicine and Health in the Soviet Union. New York, 1947.
3. Lazarévitch, I. La Médecine en l'U.R.S.S. Paris, 1953.
4. This party was assembled and despatched by the Society for Cultural Relations with the U.S.S.R. (14, Kensington Square, London, W.8). Its members were:

   Prof. ESTHER KILLICK (Royal Free Hospital), chairman; Dr. F. A. ELLIOTT (Charing Cross Hospital), deputy chairman; Mr. M. ABERCROMBIE (University College); Lord AMULREE (University College Hospital); Dr. C. ALLAN BIRCH (Chase Farm Hospital); Mr. E. G. BRAITHWAITE (South West Metropolitan Regional Hospital Board); Mr. A. RUSCOE CLARKE, F.R.C.S. (Birmingham Accident Hospital); Dr. ALEX COMFORT (University College); Dr. L. CROME (Fountain Hospital); Dr. T. D. CULBERT (United Manchester Hospitals); Dr. IDA FISHER (general practitioner, London); Mr. A. W. L. KESSEL, F.R.C.S. (Fulham and Kensington Hospital Group); Dr. HELEN MAIR (Manchester Health Department); Dr. N. B. MALLESON (University College); Dr. J. G. OLLERENSHAW (general practitioner, Skipton); Mr. ROBERT ROAF, F.R.C.S. (Liverpool Royal Infirmary); Dr. C. H. C. TOUSSAINT (Willesden Chest Clinic); and Dr. L. R. WEST (Sully Tuberculosis Hospital).

I. THE PATIENT

Let us begin at the beginning, with the unborn infant—or rather its mother.

In the U.S.S.R. women, like men, normally have paid jobs, but during pregnancy they may be given lighter work. Their antenatal care includes a Wassermann test,[5] and to prepare for childbirth many are nowadays given a course of "psychoprophylaxis," comparable to that recommended by Grantly Dick Read. (At Tbilisi[6] we were told that 80% of women thus prepared have easy deliveries.) Maternity leave is meant to start about thirty-five days before delivery and may extend to fifty or sixty days: besides full pay, the woman gets a maternity grant of 1500 roubles.[7] Mothers with more than five children receive financial help, but otherwise grants are paid only to those who work. In the countryside many women must still be delivered in their homes, but the intention is that all births shall take place in hospital. At Tbilisi mothers normally get up on the fourth day and do physical exercises daily from then until discharge on the tenth day. As in other hospitals I visited, the babies were kept separate from their mothers except at feeding-time; and premature infants, though they might get some oxygen, were not in incubators. Infants of 600–700 g. had sometimes been reared.

Maternal mortality in the U.S.S.R. in 1953 was 0·8 per 1000 births.

CHILDHOOD

Breast-feeding (three-hourly to four-hourly) is supplemented with solids at 3–4 months of age and continues till about 1 year. During the day the mother usually has her child in a creche at her workplace, and every three hours she is allowed half an hour in which to feed it. Even in hospital young babies are sometimes heavily wrapped or swaddled, and some still have dummies to suck. Circumcision, we were told at one institute, is not done. Unmarried mothers may get monthly payments, but there are no family allowances except for women with large families. Vitamin preparations, and supplementary foods, must be bought if they are wanted—which perhaps explains why rickets has not yet disappeared. But help may be given to mothers in special need: thus in a country district a woman with twins or triplets may be allotted a cow.

The sound care of mothers and children was described to us as the most important of all measures for preventing disease: "the prevention of hypertension must be begun in childhood." In cities the care of children is undertaken by special children's policlinics; and, whether the child goes off to hospital or anywhere else, the policlinic remains responsible for him till he is 16.

The children's policlinic which we saw in Moscow was a kind of health centre, looking after 27,000 children. It has no beds, and is open only by day; but it is the working base for 62 doctors—27 of them district pædiatricians, 14 of them school doctors, and the remainder specialists of various kinds. As soon as the mother gets home from the maternity hospital, a district pædiatrician and a nurse visit her; and from that time onwards she is supposed to bring the child regularly for examination—at first twice a month and then less frequently. If the

5. I cannot avoid statements of this general kind; but no-one should assume that what is done in the places we saw is necessarily done through the length and breadth of this enormous country. Central planning has achieved a great deal, but in the U.S.S.R. as elsewhere there must be big discrepancies between plan and practice. And happily, even in a single city like Moscow, medical opinions and medical methods are still by no means uniform.
6. Tbilisi (formerly Tiflis) is the capital of the Soviet Socialist Republic of Georgia, in the Caucasus.
7. For convenience, the value of the rouble is commonly reckoned at about 6*d*. But incomes cannot fairly be translated on this basis from roubles into pounds; for the value of an income depends largely on what services are free or subsidised.

mother wants advice she is seen by appointment (6 to the hour); but if the child falls ill a district pædiatrician goes to see it, and the mother may be given paid leave from work so that she can look after it. If the doctor sends the child to hospital, she will be able to visit it "perhaps two or three times a week," unless the hospital is one for infectious diseases, where visiting may be prohibited unless the child is in danger or needs breast-feeding. At a country hospital mothers could visit "freely and at length."

From hospital the child needing further care may be sent to a children's sanatorium for perhaps three months; and we were told about special forest schools for rheumatic children. For the young, as for their elders, great medical importance is attached to good holidays, and during 1952 over 5½ million children stayed in holiday camps in the countryside.

The more specific preventive tasks of the policlinic include immunisation and periodic examination. Immunisation with B.C.G. is performed at birth and repeated at 7, 12, 15, and 18 years of age. The school doctor examines all his children regularly, as well as taking special care of those who need it; but in addition there are full-dress examinations by a team of specialists.

OVERHAUL AND INSPECTION

And here we come to one of the characteristic features of Soviet practice: they set great store by frequent examination, as a means of spotting disease early, perhaps before the patient is aware of it. On the ordinary level there are examinations by a single doctor—the pædiatrician attached to a school, the internist who looks after university students, or the district doctor from the nearest policlinic. ("I, for example, am a professor," explained our friend T. "A doctor visits me regularly, examines me, and talks to me.") But in addition there are more formal examinations by teams of specialists. For Moscow children there are obligatory examinations of this kind at the ages of 3 and 7; the Moscow University student has a searching routine examination (including X-ray screening) every year; and it seems that Moscow adults are supposed to go to their policlinic once or even twice a year for an overhaul in which they spend perhaps three-quarters of an hour passing from one specialist to another.

How universal, frequent, or thorough these examinations really are, I do not know; and certainly practice will differ in different places. But in a country district we were told that the whole population is examined twice a year, the doctors going to the farm-workers at their workplaces or homes. If, as I suspect, there are many people who have no strong taste for being examined, they will be hard put to it to escape the net. If they want to join a sports club, a doctor will be waiting. If they want to go on any kind of organised expedition, or take any kind of subsidised holiday, they must get a medical board—probably at their policlinic—to certify them fit for the form of recreation they propose.

Besides all this there are special mass examinations for detecting particular diseases, such as tuberculosis, malaria, cancer, or hypertension, or for collecting data about morbidity. Small teams of specialists invade a factory or a district and examine everybody in it. Thus in one year 27 million people were examined for tuberculosis, and since 1946 some 60 million (mostly over 35 years of age) have been examined for cancer by teams usually consisting of a surgeon, a gynæcologist, a radiologist, and an internist. Untreated cancer has been found in 0·1% of those examined, and a precancerous condition in 1%. The proportion of cancers incurable when first seen is said to be falling (45% in 1946, 23% in 1950).

THE WORKER

If the worst evils of rapid industrialisation are to be avoided, close attention must be paid both to the environment and to the medical care of the worker. According to Lazarévitch [8] there have been difficulties in creating a medical organisation for this dual purpose, and when policlinics and hospitals have been established at the factory there has sometimes been wasteful duplication because the workers have preferred to attend those in the district where they live. On the environmental side the authorities are proud of the progress they have made in defining the conditions to be observed in different kinds of workshop. Already some 80 "norms" are legally enforceable, and the inspector who finds, for example, that the amount of benzene in the air exceeds the permitted limit is in a position to take immediate action. I shall later mention various kinds of measuring apparatus designed for his use on the spot.

Throughout the U.S.S.R. the ordinary working day is eight hours, but in some occupations it is six or even four. Overtime is not recognised; and if, because of some emergency or accident, the eight-hour day has to be exceeded, special permission must be obtained. In agriculture longer hours are worked at the harvest, but time off is given later. Women do the same work as men, for the same pay; but they are excluded from some dangerous occupations—e.g., underground labour, and work with toxic chemicals including lead.

After experimenting with a four-day working week, the Soviet Union has returned to a six-day week with a rest on Sundays. But this rule is perhaps more flexible than in the West; for when we visited a country hospital we found that the staff mostly had their day off on Friday, so that all should be on duty on Sunday when the local farm-workers could most easily come for advice. In the cities shops commonly remain open till late at night and some are open on Sunday.

HOLIDAYS

Every Soviet worker is supposed to get a month away from work every year, and miners (we understood) get two. One of the functions of the trade-unions is to subsidise holidays and run rest-homes and "sanatoria," and for these and other purposes they take a small toll from their members.

Anyone who prefers to make his own arrangements and pay the whole cost of his holiday can do whatever he fancies; but the person who wants his trade-union to contribute must either get its approval of the project or else apply for one of the places on a list; and if he applies late he may well be offered a rest-house just outside Moscow rather than a palace on the Black Sea. In any case he will usually have to pay his fare, and 30% of the cost of his keep, unless he can claim to be a child, an "invalid of labour or war," or tuberculous.

The holiday—and especially the holiday under close medical supervision at a health resort—is officially regarded as a very powerful means of preventing disease; and the sanatorium, with its clinical investigations, its various forms of physiotherapy, and its detailed regimen, has an important place in the medical system. For example, cases of early peptic ulcer or hypertension are often sent to a sanatorium to have the benefit of rest and treatment for the customary four weeks—which can, if need be, be expanded to six. In deciding where the patient may go, the medical board of course takes account of the scheduled contra-indications (climatic or otherwise) for particular resorts.

Where the Black Sea washes the foot-hills of the Caucasus, the sulphur *Kurort* of Sochi has 60 sanatoria—mostly classical white buildings scattered along the hillside among the trees above the shore. Here some 800 doctors treat about 300,000 people in the year, some of the patients taking a cautious course of a dozen potent sulphur baths, others enduring electrotherapy or inhalations, and others merely seabathing and sunbathing for prescribed periods. People who can afford it can stay in hotels or boarding-houses, and get treatment if they wish; and wives may bring their families to stay in a

8. *Op. cit.* (ref. 3); pp. 153–163.

shack while the patient has his cure. Everything is orderly and decorous . . . and just what our own industrial workers would say to a month in these lovely but sober surroundings I do not know. But it is certainly a pleasure to see a town laid out for the masses without vulgarity.

The Sanatorium for Mine-workers, which holds about 350 patients, has 18 doctors, 32 medical ancillaries, and 300 other workers—a ratio of 1 patient to 1 worker. It is a large luxurious hydro, with a funicular railway down to the beach, where on wooden jetties the bronzed and burly miners sit basking in bathing-trunks and spectacles, and reading (one likes to think) the works of Marx and Engels. They are wondering perhaps whether they made the right choice for the lunch they will soon be having in the huge Renaissance dining-room: maybe after the sausage, turkey, and bortsch it would have been wiser to have had the Wiener schnitzel rather than the fish; but at worst one can make up on the hors-d'œuvres and sweets, the tea or coffee, and the other accompaniments. A little slip on the lunch-table tells the comrade that the doctor expects him in room 140 after his rest. But in the evening he will see a film in the open-air cinema, or go to one of the theatres in the town; by good luck his wife is herself a surface-worker in the mines and is staying with him in the sanatorium; and it is pleasant to think of the children having such fun at their holiday camp.

The Sanatorium for Intellectual Workers, maintained by the ministry of education, is newer, less magnificent, and more like home, and it has a really beautiful cinema and concert hall besides a library and a billiards room. It takes 300 patients and has 16 doctors. The view from the path lab is enchanting.

Even after all that one has heard about Russia, a place like Sochi comes as a surprise. In a country with so many urgent needs, in housing, irrigation, and so on, it seems extraordinary that anyone should put up such very elaborate and costly buildings when something far cheaper would serve their medical purpose. But in terms of incentives and rewards they may make sense. After all, the health resorts of other countries have expensive hotels for their élite, and the Russians are only following precedent, though they select their élite differently. Exactly how they do select it is perhaps less evident: one would like to know who in fact does get to the more desirable resorts, and how much chance people have of getting a subsidised holiday unless some non-medical word is said in season. But at least we cannot doubt the sincere desire of the medical authorities to extend the health-resort movement, and especially to provide more rest-homes and sanatoria for some of the large populations in central and eastern Russia. At some 250 health resorts, with 2000 sanatoria, about 4 million people were treated in 1953; and much more is in prospect. On the scientific side, 13 research institutes are devoted to the problems of health resorts and natural waters.

IN HOSPITAL

Alike in the consulting-room of a policlinic, in the electrocardiography department of a sanatorium, and in the ward corridor of a hospital, the Russians commonly manage to avoid the institutional "outpatients" atmosphere too often associated with our own medical work. They do it partly with climbing green plants in pots; partly with ornamental but washable curtains; partly with photographs of their children; and partly perhaps by not acquiring a hospital manner. On the other hand, from the moment of arrival the patient is made aware that Pasteur did *not* live in vain. Hospital laundry must be done on a very lavish scale, and we were seldom allowed within sight of a clinical department without putting on white coats or gowns. Often there were masks too, though these were made from only two layers of gauze. At an infectious-diseases hospital our hands were bathed in spirit when we left.

The most puzzling piece of aseptic ritual was in an institute where blood was collected. As in some other countries, the donor lies on a couch in one room and puts his arm through a hole into another room where the doctor draws off his blood. But before these donors were laid on their couch they were given a shower, attired in gown and mask, and even exposed to ultraviolet rays on their way upstairs. Perhaps these impressive precautions made the occasion seem more momentous and made them more willing to come again.[9]

All the hospitals I visited struck me as very clean, and free from smells. In contrast, their lavatories were sometimes unacceptable by British standards, though (unlike some of ours) they generally provided some means of washing the hands.

As in 1936, I still think that the Russian hospital may be better than some of ours for the patient who mainly needs sympathetic care and long-established treatment. But I cannot suppose that it offers an equal chance to the patient whose survival depends on one of the newer techniques of medicine, such as the maintenance of fluid and electrolyte balance, the use of endocrine preparations, or treatment with the more recent antibiotics. In concentrating on local anæsthesia for operations, Soviet surgeons have been influenced by the need to devise and teach methods that can be readily applied by the doctor without special experience—working anywhere between Archangel, Afghanistan, and Alaska. They have achieved such skill that procaine injections suffice them for pneumonectomy, for creating an artificial œsophagus, or for removing an intracranial tumour. But neither patient nor surgeon yet enjoys the benefits that recent developments in general anæsthesia have conferred on their fellows in the West.

PENSIONS

Pensions are non-contributory and are paid by the ministry of social insurance through the trade-unions. There is no unemployment insurance, because everybody is supposed to be able to find work.

What about the unemployable, we asked—the man who cannot hold down any job? In such a case the organs of the community would intervene. Perhaps a meeting would be held, and he would be scolded. "When are you going to stop this bad habit of losing all your jobs?" Even the rolling stone must stop rolling sometime. If need be, the enterprise where he worked might help his dependants, who were not to blame for his follies.

A widow gets no pension if she can work, but each of her children gets a small one.

Disability pensions amount to 35–75% of wages for general diseases and up to 100% for diseases or accidents arising out of work. No compensation is payable if an injury does not interfere with the work the person was doing, and the degree of disability is the degree to which he is hindered in that work. Even with a 100% pension he is free to take another job; and, though factories and other employing agencies are not obliged to take a quota of disabled persons, they are expected to give them some priority and make allowances if their efficiency is not quite what it was. Artificial limbs and other prostheses are supplied free, and by next December there will be 10,000 three-wheel invalid carriages on the roads. Some disabled men and women are sent to professional and technical schools where they may spend as long as two

9. In Leningrad at least, blood-donors do not lose wages while away from work. They get a drink of tea before giving blood and a four-course meal afterwards. So that their diet may be supplemented in the next few days, they are handed 60 roubles for every 100 ml. of blood removed; but the maximum taken is only 250 ml. They may be called again after forty days, and in theory they can give blood seven or eight times a year: but actually they seldom do so more than four times. They are held in public esteem, and those with long records may be rewarded with orders and medals, or perhaps gifts such as a watch or a bracelet.

or three years (supported by a stipend) in learning a new trade or occupation.[10]

Retirement pensions, amounting to 50–60% of the average wage or salary during the previous two years, are normally payable at 60 for men and 55 for women. In some branches of heavy industry they are payable five years earlier. In certain occupations, including medicine, science, and agriculture, a retirement pension is payable after a given number of years' employment (twenty-five years, I was told, for doctors).

What happens, one of us asked, when the cost of living goes up? Do the pensions rise correspondingly? This question does not arise, was the reply. The cost of living is not going up but coming down: for example, food prices have been reduced on six occasions.

OLD PEOPLE AND THE CHRONIC SICK

For old people, and others who cannot look after themselves, the ministry of social insurance is this year putting up 30 new "houses," each holding 100–400. Some will be in the country and some in (or on the outskirts of) towns. Some will take both the aged and the disabled—but not the insane and the tuberculous, for whom separate arrangements are made.

Of existing old people's homes, some of us did see one example.

Founded sixty years ago and administered by the Russian Theatrical Society with State money, it houses 175 retired actors and actresses. They have pensions ranging from 150 to 800 roubles a month, but they pay nothing towards their keep. They have much liberty ("Yes," said the director, "freedom of action is bad for the administration but good for the inhabitants") and some had been to the Crimea and the Caucasus for their summer holidays. With its excellent furniture (old and new), its signed photographs of Sarah Bernhardt and Chaliapin, its enormous friendly dogs, and its charming tenants with their memoirs and their memories, this home can hardly have been entirely representative of provision for the aged in the Soviet Union or anywhere else. Be that as it may, the new medical wing, with its sick-bay and its physiotherapy, was as suitable for its purpose as the old mansion, and as well equipped, in its way, as a sanatorium.

At the miniature banquet provided on our departure one of our hostesses proposed the health of our profession—supreme through its power to save life. "Life?" (or words to that effect) replied Lord Amulree. "What is the worth of life unless, while we live, the spirit is elevated, the mind is entertained, the heart is touched? It is to you, the artistes . . ." After which we dashed off to pack. But gerontology, one sees, is art as well as science.

II. THE DOCTOR

In Tsarist Russia there were about 20,000 doctors, but now there are 300,000. More than half are women, but the proportion seems to have fallen a little, and in visiting institutes and hospitals I fancied that the most senior posts were more often held by men.

The schools turn out three separate kinds of doctors—the therapeutist, the pædiatrician, and the sanitarian. From about half-way through the six-year curriculum, the pædiatrician and sanitarian get specialised training.

The civilian doctor is exempt from military service except in time of war; for the army gets its doctors from a special military medical academy. The newly qualified, however, are likely to be sent for several years to some outlying part of the Soviet Union where few would spontaneously choose to practise.

Formerly they were posted by the ministry of health, but now the decision is made by their own medical school. In Moscow we were told how the young doctor goes to a conference in the director or dean's office, where his future is discussed by representatives of various branches of medicine and also with representatives of the enterprises requiring medical aid. An obstetrician is wanted, he is told, in the fish industry; and this will doubtless appeal to him if he is fond of caviare. Should he have married a fellow student a place may be found for man and wife; or a group of friends may be able to go together to Siberia or Sakhalin. In remote places, salaries are higher than at home.[11]

PRACTICE

After thirty-six years of a different system it was hard to make our hosts understand what we meant by a general practitioner. We objected when the interpreters translated the term as "private practitioner," because we thought this sounded as though doctors in the N.H.S. were still being paid directly by their patients. But perhaps the word private is not so inappropriate after all; for under the N.H.S. the patient makes what is essentially a private arrangement with his chosen doctor, who personally undertakes to look after him. In the Soviet Union there is no such contract: the doctor is a public servant whose primary loyalty is towards the State, not towards the patient who consults him. He does not regard himself as an individual practitioner, assuming full charge of his patient and exercising full responsibility, but rather as a member of a service: he does not practise from his private house but from a medical station, dispensary, policlinic, or hospital, which is the local outpost of the service and where he forms one of a medical team.

True, the district doctor has his own area, and during his daily period on duty he visits the sick.[12] His patients calling at the policlinic will probably ask to see him rather than a colleague, and if he is not available they may decide to call again when he will be. But he is at work for only part of the day; and in cities anyone wanting aid outside certain hours has to apply to a separate emergency service. He may or may not be interested in the whole household and its affairs, but he is certainly not a "family doctor," for he undertakes no obstetrics and is not concerned with the children, who are looked after by pædiatricians from the children's policlinic. Moreover, before very long he may move on to another place or become a specialist.

In the countryside the pattern is probably more personal. We saw a district hospital where several of the staff have worked for twenty and thirty years or more. The working week of some of them included a "prophylactic day" when they visited the homes of people who were not ill. At harvest-time they would set up a "medical tent" in the fields.

"Do patients take their non-medical troubles to their doctor?" we asked: "would a woman consult him because her husband drank?" "What would be the good of that?" was the reply. She would go to the authorities at the place where her husband worked, or to the trade-union. In matters of character or worries, how could a doctor help?

10. Lazarévitch writes of difficulties encountered in producing good prostheses in sufficient numbers, and also of difficulties arising where the work of the ministry of health joins that of the ministry of social insurance. Quoting a statement by Issaiev that "Socialist realism has radically changed old ideas of capacity for work and invalidity," and a complaint that medical boards in assessing invalidity were relying solely on *medical* data, Lazarévitch suggests that, because of the shortage of labour, the disabled may not in fact be put in the category to which they medically belong. (*Op. cit.* (ref. 3); pp. 144–152, 163–167.)

11. The other side of the picture is painted by Lazarévitch, who says that husband and wife are often separated, that on arriving at their distant post the doctors sometimes find that they are not expected or that conditions of living are intolerable, and that a considerable number either do not reach their destination or, when they get there, refuse to stay. She says too that doctors trained as sanitarians are often deeply discontented with public-health work and want to do curative medicine. A great many posts in public health as well as in clinical medicine remain unfilled, or are filled by people with quite insufficient qualifications. (*Op. cit.* (ref. 3); pp. 82, 83, 97–99.)

12. Sometimes a motor-car is at his disposal. A Moscow policlinic with 15 district doctors and "doctors on duty" had three cars.

No difference between British and Russian practice struck me more forcibly than the apparent disinclination of the Russians to accept emotional disturbance as a cause of illness. Whereas any British patient today is lucky if he escapes a diagnosis of functional disorder, or at least of "psychological overlay," neuroses and psychoneuroses figure very little in the Russian clinical vocabulary. The bottle-of-medicine habit must also be far less prevalent; for the Soviet medical service is far less generous than ours in that the patient has to pay for all drugs beyond those consumed on medical premises. If he needs medicine at home he is given a prescription to be made up by a pharmacy at his own expense. (If he really cannot pay he can apply for assistance.)

In Russia, as elsewhere, doctors do not always work with one eye on the clock. Officially, however, their working day is only six and a half hours: indeed, for radiologists, psychiatrists, and those in contact with open tuberculosis or other infections it is less (sometimes only four hours). Doctors may, however, hold more than one post, and they may divide their six and a half hours between different appointments. Evidently the difficulty of integrating different parts of medicine, and the tendency for medical men and women to get into a narrow groove and lose general efficiency, are at least as apparent in Russia as in this country; and some years ago it was laid down that dispensary or policlinic doctors should all do some work in hospital,[13] while it is likewise hoped that some day all hospital doctors will also work in dispensaries. I doubt whether even the first aim has yet been generally achieved.

In a service where administration seems to be mainly in the hands of doctors, it is noteworthy that medical administrators—even the deputy ministers of health of the U.S.S.R.—usually work also as clinicians. Medical institutions have lay stewards and finance officers, but these are there as assistants to the medical director.

THE SPECIALIST

The Russian specialist is by no means necessarily someone whom we in this country would regard as a consultant. In surgery, for instance, there are five grades, ranging downwards from the man who is qualified to take charge of a large clinic to the one who is not supposed to operate except in emergency. In providing for scattered populations linked by very rudimentary roads[14] it may sometimes be necessary that a small isolated hospital which has only twenty beds in all should number a surgeon of sorts among its staff; but such a man will get little surgical experience, and only by taking him frequently to some large centre for postgraduate training can his talents be saved from rusting. Some members of our party felt that, in towns as well as in the country, the allocation of specialists to smallish units must seriously damage their efficiency as specialists. A city policlinic, without beds and serving fewer than 25,000 adults, employs, among others, the following:

1 director of surgery	2 ophthalmologists
2 surgeons	2 neurologists
2 E.N.T. surgeons	2 radiologists
2 gynæcologists	1 endocrinologist
2 cancer specialists	

All working there five hours a day, what can they find to do? The answer is presumably that much of their time goes into the periodic medical examinations which I have described as a feature of the service. But how then can the neurologists, for example, see enough cases to acquire real proficiency—even if they also spend a few hours each week at a hospital? The result must be that they tend to work "by the book" rather than from practical experience.

Clearly such a specialist cannot be sufficient unto himself, and in the Soviet Union he works under supervision. Responsibility for the efficiency of the pædiatricians of a region rests on the chief pædiatrician of that region; and he exercises authority not only in casual visits but also as chairman of a commission which once a year visits every medical unit in the region. For each pædiatrician this commission issues a certificate saying either (1) that the holder is competent to do her job, or (2) that she is competent to do a bigger job, or (3) that she needs further training.

Parallel with this control is the "methodological" work of the research institutes of the specialty. Part of the task of the institute is to introduce science into practice; and to this end its staff compile and issue circulars, visit the specialists of their area, give lectures, convene conferences, hold seminars, and conduct or watch operations. There are apparently no rules as to what a local surgeon or other specialist may or may not undertake; but where he is found to be deficient in skill or knowledge for the work he is doing the staff of the institute will arrange for him to take a course for some months in one of their hospitals. Doctors are said to welcome such opportunities, since by extra stipends and otherwise they are relieved of any expense from the temporary move. Many members of the profession were trained at a time when standards were low and the curriculum lasted as little as four years, and the Soviet authorities thus have particular need to make postgraduate education easy. But the scheme works less well in some places than in others.

PAY

With their hierarchical system in mind, some of our hosts were staggered to hear that in this country a general practitioner may earn more than a professor.

Under the present Russian version of Socialism ("to each according to his work") salary ranges are generally wider than here. The big contrasts in income are to some extent offset by the existence of more free or subsidised services open to all, but there is no income-tax.

If I heard aright, the basic salary of the young doctor is 660 roubles a month. The director of a policlinic with a medical staff of 45 was getting 1750 roubles, and her district doctors 1250. (A miner, I was informed, earns 2000 roubles; and one of our young women interpreters, working at an educational institute, was receiving 1500). Medical salaries rise by seniority, but I gathered that merit awards may be given by the commissions which annually assess the doctor's work. Additional payments are made for degrees, and in the academic world salaries increase sharply. Thus, for a doctor of medicine, a professorial chair carries a salary of 7000 roubles; an M.D. who has the title of professor and is director of a medical institute gets 8000 roubles; and if he is also chief of a professorial department he will in addition have half the salary for that post, making 11,500 roubles in all. Besides this he may receive prizes, or money for the books he writes; and no doubt a variety of privileges.

TOO MANY DOCTORS?

Traditionally, much of the simpler medical care in Russia is given by feldschers, who have a shorter training than doctors and roughly correspond to the sub-assistant surgeons formerly employed in India. The minister of health of a republic told us that he expects the use of feldschers to continue, under the control of doctors, since they are valuable for manning small medical posts—on collective farms for example. But on the important question whether it is best to have (1) many doctors, or (2) comparatively few doctors aided at all possible points by medical ancillaries, the Soviet authorities seem to have come down on the side of many doctors.

13. *Op. cit.* (ref. 3); p. 42.
14. There are also aeroplanes, of course. We were told (unofficially) about a young surgeon in a remote place who ran into difficulties while operating under the usual local anæsthetic. Explaining to the patient that there would now be an interval, he summoned aid by telephone; and in ninety minutes the regional surgeon had arrived by aeroplane and was successfully finishing the job.

Like some other observers, we were struck by the apparent abundance of doctors in the institutions we visited [15]—an exception, however, being one of the medical schools, where the complement of preclinical teachers was below what would be customary here. On the other hand, what may appear an extravagantly large staff may have the advantage that doctors have ample time to give their patients: and I have heard it said that Russian hospital doctors believe in getting to know their patients by spending a lot of time in talking to them in the wards.

Which brings us back again to the doctor-patient relationship in the Soviet Union. Though in principle this is different from ours, it would be interesting to know how far it is inferior in practice. The fact that a doctor is technically an official need not mean that he comports himself continuously as an official; and I hope that some day a competent Western observer will be able to give us a satisfying comparison of the two systems in this regard. All I can say about it now is that there seemed to be kindness and humanity there as here.

(To be concluded)

15. For a population of over 200 million, 300,000 doctors does not in fact provide a very high ratio. But presumably they are not yet evenly distributed, and I assume that the preferred pattern is what we saw in Western Russia.

International Congresses

NUTRITION

THE 3rd Congress under the auspices of the International Union of Nutritional Sciences was held in Amsterdam from Sept. 13 to 17. Prof. B. C. P. JANSEN was president and Dr. M. VAN EEKELEN secretary. About 400 members from over twenty nations attended, and sixty communications were given.

Obesity

Obesity was the central theme of the first group of eleven papers. The necessity for its discussion indicated the changed circumstances since the 1st International Conference, which had been concerned with the effects of war in causing undernutrition throughout Europe.

R. A. MCCANCE pointed out that an excessive appetite for food was the fundamental cause of obesity. The accumulation of fat was, however, a normal phase in the development of some animals, notably seals.

E. M. WIDDOWSON said that large fat girl babies tended to mature and marry young, and to complete the cycle by having plentiful milk for their own large children.

G. C. KENNEDY spoke on the incidence of degenerative diseases in mice rendered obese by hypothalamic puncture; the development of various diseases was accelerated, but no new diseases were encountered.

J. MAYER held that the level of sugar in the blood has an important rôle in the control of appetite. The mechanism was complex, however, and in mice might be disturbed in different ways by genealogical factors, by hypothalamic puncture, or by injections of gold thioglucose.

R. PASSMORE had found no special mechanism for the disposal of excessive food eaten by healthy volunteers of thin body-build.

Z. A. LEITNER reported serial recordings of blood-pressure in patients who had been treated by diet for obesity. With obese hypertensives the influence of dietary treatment was more encouraging in women than in men.

J. VAGUE suggested that the locality of fat distribution might follow male or female patterns in either sex, and that the liability to atherosclerosis and diabetes depended on the type of distribution.

Kwashiorkor

Protein deficiency, and the related problems of kwashiorkor and various forms of liver disease, were the subject of the next twelve papers.

J. F. BROCK described an extensive survey of the incidence of kwashiorkor throughout Africa, and emphasised the value of dried skimmed milk in its treatment.

V. N. PATWARDHAN spoke on the incidence of cirrhosis and other liver diseases in India; the interplay between malnutrition and chemical, bacterial, or viral toxins required intensive study.

E. J. BIGWOOD reported abnormalities in the protein composition of the hair in kwashiorkor; and E. M. DE MAEYER told of reductions of albumin, cholesterol, and amylase in the blood.

R. SCHOENTAL had found in rats which had received senecio alkaloids toxic effects which were thought to resemble kwashiorkor. She suggested that kwashiorkor might be due to the use of the alkaloids in African remedies; but J. F. BROCK disputed this view.

M. AUTRET discussed problems in providing food, and in improving local conditions, in order to prevent kwashiorkor.

J. WATERLOW reported reductions in protein, nucleic acid, and enzymes in specimens of liver obtained from malnourished infants by biopsy.

L. N. WENT had found low gamma-globulin levels in the blood in kwashiorkor.

E. KODICEK described injuries to the liver and spleen of the rat in chronic folic-acid deficiency.

Human Milk

P. GYÖRGY described new work on the presence in human milk of a growth factor for a special strain of *Lactobacillus bifidus*, named *L. bifidus* var. *Penn*. The presence of this factor might explain why human milk nourished infants adequately despite its low protein content. The factor was also present in saliva, semen, amniotic fluid, meconium, and tears. Rat's milk was a rich source; but the milks of the cow, ewe, and goat contained little. A similarity to Castle's anti-anæmic intrinsic factor was suggested by the presence of the new factor in hog's gastric mucin, and a relation with the serological blood-group factors also seemed probable. Presumably human milk was superior to cow's milk in encouraging a characteristic pattern in the intestinal bacterial flora.

Psychology and Nutrition

A session on the relation of nutrition to psychology was opened by J. BROZEC, who cited pellagra, in which "dementia" is a common symptom, as a classical example of disturbed brain function in nutritional deficiency.

F. VERZAR spoke of the addiction of malnourished South American Indians to cocaine ingested by chewing the leaves of *Erythroxylon coca*; the desire was lost when the diet was improved.

MAVIS GUNTHER discussed the first responses of infants to feeding. She emphasised the importance of the shape of the mouth, and the necessity for avoiding obstruction to the nasal airway by an upward curled lip.

Food Additives

Two further sessions were devoted to the important and controversial topic of foreign substances in foods.

A. L. BACHARACH remarked on the need to balance the benefits of additives against their possible toxicity. Thus certain insecticides were undoubtedly poisonous; but by their judicious use a 10% loss of the food-supplies of a hungry world could be avoided.

J. M. BARNES criticised the use of long-term feeding tests to discover the toxic hazards of food adjuncts; he made a plea for the more widespread use of subacute toxicity tests, with more careful examination of any positive findings so disclosed. H. DRUCKNEY, however,

emphasised the necessity for very prolonged tests in studying the carcinogenic properties of certain aniline dyes. He distinguished between (1) effects due to the concentration of the poison at any one time, which were reversible if the poison was removed, and (2) irreversible effects due to the total amount of poison taken over a period. Thus the appearance of liver cancer might be delayed until a year after the administration of an injurious dye had been stopped. A list of non-toxic dyes for use in food manufacture, under specified conditions, was being drawn up.

G. V. VAN ESCH had found that various gallates used as antioxidants in the preservation of food were harmless, even when given in large concentrations.

A. C. FRAZER criticised the design and interpretation of typical toxicity tests for food additives. If it was arbitrarily decided to test toxicity at ten or a hundred times the usual level of dosage, various undesired complications might be introduced. Thus if such common nutrients as ascorbic acid or common salt were included at the level of 25% in the diet of rats, these were both highly toxic. The conduct of toxicity tests should be based on intelligent appreciation of objectives, rather than on a rigid enforcement of arbitrary, regulations.

H. VON GENDEREN spoke on pesticides. He compared safe substances, such as chlordane to protect carrots, with unsafe substances such as phenyl mercuric acetate which had been proposed for the protection of cucumbers.

K. H. WAGNER gave an example of the unintended presence in food of a toxic substance—namely, lead in yeast grown on the sulphite liquor obtained in the cellulose industry.

The Congress unanimously adopted a resolution requesting its committee to encourage international control of the use of food additives.

Some Other Topics

The dietary defects caused by "veganism," an extreme form of vegetarianism, were discussed by J. F. DE WIJN and F. WOKES. Other speakers included ELIANE LE BRETON (effect of choline deficiency in increasing the liability of rats to liver cancer induced by the dye *p*-dimethylaminoazobenzene); J. G. BIERI (use of circulating carotenoids in the rabbit and chick); A. E. SOBEL (transfer of topically applied vitamin A through the skin); D. P. CUTHBERTSON (effect of the plan of nutrition on growth and reproduction in farm stock); and Z. M. BACQ and his colleagues (action of the insect-growth stimulant dicarnitine in rats and dogs).

At a committee meeting of the International Union Prof. E. J. BIGWOOD (Brussels) was re-elected chairman, and Mr. L. J. HARRIS, SC.D., of Cambridge, was re-elected secretary. It was decided that the next congress should be held in Paris in 1957.

CLINICAL PATHOLOGY AND GEOGRAPHICAL PATHOLOGY

(*concluded* *)

Diseases of the Newborn

C. MCNEIL and C. D. FULLMER (Salt Lake City, Utah) reported a significant increase in abortion-rate when the father was of A or B group and the mother of O group, while the lowest rate was found when both parents belonged to group O. Immune anti-A and anti-B antibodies were found most frequently in couples where the wife had spontaneous abortion. These workers suggested that ABO incompatibility was a causal factor in spontaneous abortion. They also suggested that there exists a very effective protein fraction which usually prevents maternal-fœtal conflict but which is absent in some women; such a mechanism would be in keeping with the well-known anti-hæmolytic protection which the fœtus has prior to birth.

J. L. EMERY (Sheffield) described necropsy findings in the livers of 98 stillborn infants and neonates. In icterus neonatorum there appeared to be two factors. One was intrauterine, associated with degenerative changes in the right liver before birth, and probably due to placental insufficiencies; the other was a rapid physiological postnatal involution of the left liver. Stress or anoxia in the fœtus gave rise to degeneration of the right half of the liver.

H. F. SMETANA and F. B. JOHNSON (Washington) discussed the histopathology of the giant-cell form of hepatitis neonatorum. The lack of bile canaliculi was the significant feature responsible for the pathological changes, and therefore the disorder should be regarded as a primary aplasia of the bile capillaries. Nevertheless intra-uterine infection, possibly viral, could give rise to such a malformation.

R. A. MCDOUGAL (Akron, Ohio) and P. R. BEAMER and S. HELLERSTEIN (Indianapolis, Ind.) described the case of an infant who died of a hæmorrhagic diathesis on the twelfth day of life and showed at necropsy diffuse, massive necrosis of the liver. Intranuclear inclusion-bodies were seen in most of the surviving liver cells, and the virus of herpes simplex was isolated. The infant was believed to have been infected in utero, because the mother had had a febrile illness.

Carcinoma of the Lung

J. CLEMMESEN and A. NIELSEN (Copenhagen) reviewed knowledge of the geographical and racial distribution of bronchial carcinoma and emphasised the importance of building up comparisons between areas of essentially the same kind—for instance, cities of comparable size. Figures on incidence were more reliable than those on mortality. The incidence of lung cancer in Copenhagen was rising, and it was predicted that when the curve for men born in 1905 was completed the number of men affected would equal the number for all other cancers among men. This increase did not start before 1930. The first age-group to be affected was composed of men born in 1860; and the increase was shown before the age of 75, suggesting an exposure to the carcinogen in the years 1900–10. There was a considerable difference of level in the "cohorts" born after 1885, and this also pointed to an increase in exposure between 1900 and 1910. Dr. Clemmesen compared the incidence figures for Norway, Finland, England, Denmark, and Japan and then referred to figures provided by Dr. L. Krock on the incidence of cancer of the lung in Stockholm dogs. 38 cases had been found in 7000 necropsies, the total cancer cases amounting to about 6%. The incidence had been fairly constant over the years, so there was nothing to suggest that atmospheric pollution was a causal factor. He concluded that outside England there was nothing to support the assumption that bronchial carcinoma was associated with atmospheric pollution, except the fact that the increase in cases was more advanced in urban than in rural areas.

P. D. ROSAHN (New Britain, Conn.) commented on the seemingly low incidence of bronchial carcinoma in Thailand. In this country locally made paper-wrapped cigarettes of Virginia-type tobacco were becoming increasingly popular, but in addition there was widespread smoking of native tobacco wrapped in banana leaves or lotus petals. A study of the relative incidence of the disease in the two groups of smokers might be of interest.

N. RINGERTZ (Stockholm) concluded that a minor proportion of lung cancer cases was caused mainly by endogenous factors. Possibly it would be found that this minority was shared equally by the sexes and was largely composed of adenocarcinoma. It was difficult to assess the importance of atmospheric pollution unless due attention was paid to the smoking habits of the persons concerned. It seemed doubtful whether the concentration of carcinogens in the free air was sufficient to be of great importance, but he thought the more heavily polluted air in many working-places might be so. The evidence in favour of tobacco-smoking, and especially cigarette-smoking, being the most important exogenous factor was strong but so far not quite complete. It would be impossible to check the rising wave of lung-cancer incidence for at least two more decades; but working with a distant aim, we had to intensify research on the nature and possible elimination of carcinogenic factors in tobacco smoke and try to diminish air pollution in industrial working-places; in addition it was our duty to advise the young generation against excessive smoking. Dr. Ringertz spoke of the high cigarette consumption in Great Britain which in 1939 reached nearly 1600 per head of the population, while in countries such as Switzerland, the Netherlands, and Denmark the figure varied between 350 and 600. Indeed they had not then reached the figure of 800 which represented the British annual consumption per head in the year 1924; at this time their average was as low as 150–300. The expected rise in lung-cancer incidence in Iceland, where cigarette consumption was low up to the

* The earlier parts of the congress were described in *The Lancet* of Sept. 25 (p. 651).

time of the 1939–45 war, would provide a good opportunity for analysing the duration of the supposed latency between the commencement of smoking and the appearance of the cancer.

GEORGIANA BONSER (Leeds) reported on a series of new cases of lung cancer diagnosed in three hospital centres (Aberdeen, Birmingham, and Leeds) in the years 1948–52. The higher incidence in urban areas and the higher male sex ratio in urban areas, coupled with the fact that when women were exposed to industrial hazards they were more liable than usual to develop the disease, suggested that males were normally exposed to some carcinogenic influence from which females were relatively protected. The figures she presented suggested that pneumonectomy improved the prognosis, for the survival-rate in the second and third years was better than in the non-operated group.

S. J. CUTLER (Bethesda, Md.) dealt specifically with the relative probability of lung cancer in smokers and non-smokers. Information collected from clinical studies made it possible to calculate the expected incidence in White males who were now about 40 years old. The chances were that 6 out of 1000 would develop lung cancer before the age of 80 if they were non-smokers; and the figure rose to 25 for light smokers, 49 for moderate smokers, and 80 for those who smoked more than one packet of cigarettes a day. These estimates applied whether or not smoking per se caused lung cancer. It was interesting that the risk for light smokers was four times as great as for non-smokers.

J. DELARUE (Paris) reviewed the pathological anatomy of lung cancer, commenting on the identical nature of the histological findings in different parts of the world. PAO-CHANG HOU (Hong-Kong) dealt with the pathological findings in 52 cases. Half of the tumours metastasised to the brain, and 44·2% showed metastases (usually bilateral) in the adrenals. Other organs commonly involved were liver (40·4%), kidney (36·5%), bone (19·2%), heart and pericardium (15·48%), and pancreas (11·6%). Lymph-node involvement was noted in every case.

Medicolegal Pathology

R. S. FISHER and R. LINDENBERG (Baltimore, Md.) described the distribution of primary brain-stem lesions which they had found in 30% of fatal cases of brain trauma. The lesions were found most commonly in the posterior hypothalamus, the mid-brain, and the upper part of the pons, and least of all in the putamen and medulla oblongata. These predilection areas were governed by the anatomy of the vascular supply and by the anatomical relation of the falx and tentorium to the various sections of the brain-stem. The lesions in the brain-stem spoke in general of downward and posterior displacement of the brain-stem structures in relation to the tentorium.

L. ADELSON and ELEANOR R. KINNEY (Cleveland, Ohio) reported their findings in 130 cases of sudden and unexpected natural death in infants and children between the ages of 10 days and 2 years. Primary acute infectious disease of the respiratory tract, sometimes requiring microscopy for its demonstration, accounted for the majority of the deaths (72%), but in 11% of cases no demonstrable lesion was found other than "hæmodynamic changes." Mechanical asphyxiation by bedclothes was not, in their opinion, a serious consideration. Dr. Adelson concluded: "Proper dissemination of this information to the bereaved parents and to the general public has practically eliminated the notion in our country that these deaths are accidental. A real dividend of reassurance and peace of mind has thus been contributed to the community."

Miscellaneous Topics

F. HENSCHEN (Stockholm) delivered a Askanazy lecture. He discussed hereditary disease in the four Nordic countries. The populations were stable and comparatively homogeneous, and the isolation of small communities due to the nature of the terrain favoured intermarriage and the manifestation of recessive genes. Archives were good in most of the administrative areas; so numerous hereditary diseases, many examples of which he cited, could be followed back to earlier centuries and to heterozygotic areas.

E. W. GAULT (Vellore, Madras) spoke on the incidence in India of space-occupying lesions of the brain due to parasitic and other infections. In all, these amounted to a fifth of all space-occupying lesions. Tuberculoma was almost four times as common as cysticercosis. The high incidence of tuberculoma was about on a par with that in England and America before measures were adopted against tuberculosis.

M. STRAUB and H. E. SCHORNAGEL (Rotterdam) compared disease in the Netherlands during the late war with that after the war. A distinct increase in the incidence of tuberculosis, often of lymph-node type, became apparent as early as 1941, but the incidence decreased quickly after the war. On the other hand the war had a favourable influence on the incidence of pulmonary embolism, coronary-artery occlusion, and cholelithiasis.

LIE KIAN JOE and SUTOMO TJOKRONEGORO (Djakarta, Indonesia) reported on 104 liver biopsies obtained from children with kwashiorkor-like conditions; only 18 showed moderate to severe fibrosis. Hepatic fibrosis in Indonesian children was not uncommon and indeed was found 11 times in 57 biopsies on children who appeared to be well nourished. No reason had been found for this condition other than viral hepatitis, but whether these two disorders could be ætiologically related was as yet uncertain.

The Ward Burdick award lecture was delivered by ISRAEL DAVIDSOHN (Chicago, Ill.), who spoke on immunohæmatology, a new branch of clinical pathology.

Public Health

New Health Clinic at Exeter

Whipton Health Clinic, Exeter, was opened on Sept. 28 by Mr. Iain Macleod, the Minister of Health. Originally intended to be part of a larger scheme including general-practitioner and allied services, the centre provides only for health-authority and school health services. In addition to accommodation for maternity and child-welfare clinics, the centre contains a dental suite, a minor-ailments room, a separate consulting-room for health visitors, a hall for educational purposes, and a play space for toddlers and a perambulator shed both of which are overlooked from the main waiting-hall. The cost was £15,000.

At the opening Mr. Macleod said that the credit for the steady decline in infant mortality lay not with parties and politicians, but with doctors, nurses, midwives, and health visitors, and especially parents; local authorites could claim a real share. The national infant-mortality rate had dropped below 30 per 1000 and would be less this year; our rate was now below that in the U.S.A. The centre indicated the way the health services must advance: it was to be a happy club for health and not a dispensary for sickness. When the difficulties crystallised in the hospital waiting-lists had been overcome, an attempt must be made to give the health service a definite twist to the preventive side. Mr. Macleod emphasised the importance of the dental service to mothers and young children, and praised the work of the city's occupation centre for ineducable mentally defective children.

Infectious Diseases in England and Wales

Disease	Week ended September			
	4	11	18	25*
Diphtheria	11	12	9	8
Dysentery	317	220	309	308
Encephalitis:				
Infective	3	1	3	4
Postinfectious	2	4	—	—
Food-poisoning	248	336	224	265
Measles, excluding rubella	1575	1084	1286	1415
Meningococcal infection	26	24	23	21
Ophthalmia neonatorum	34	30	39	37
Paratyphoid fever	18	21	10	11
Pneumonia, primary or influenzal	229	262	230	251
Poliomyelitis:				
Paralytic	44	47	58	49
Non-paralytic	27	31	34	35
Puerperal pyrexia	262	210	201	212
Scarlet fever	360	314	426	526
Smallpox	—	—	—	—
Tuberculosis:				
Respiratory	621	636	740	694
Meninges and C.N.S.	6	15	12	10
Other	74	91	88	82
Typhoid fever	6	4	5	2
Typhus fever	—	—	—	1†
Whooping-cough	1988	2017	1668	1566

* Not including late returns.
† Imported case.

In England Now

A Running Commentary by Peripatetic Correspondents

ONE of the chief features of our annual pilgrimage to the North is our visits to the shops. The sweet-shops, for example. In Scotland the buying of sweets is properly recognised for what it is—a serious and important business. As the bell rings the presiding genius emerges from the ben room to discuss our respective healths, canvass our opinions on the weather, and in general initiate a friendly chat on the topics of the day. After some time we gently steer the conversation round to the merchandise on the shelves, and a delightful conducted tour among this ensues, with brief judgments and summaries, assisted in borderline cases by a judicious sample. "This is mebbe rather a darker chocolate than ye might like": "These ones have a kind of chewy centre": "This is a new one and I canna just recommend it personally, but it's been selling very well." Eventually the appropriate mixture of caramels is specially blended for us from several assortments, and we collect our little parcels and leave with mutual assurances of good will.

The same attitude permeates other branches of trade. On our last visit we decided to bring back with us some of the excellent beef we had been eating, and we visited the butcher to arrange matters. We felt at once that we were in good hands. Our problem was gravely and sympathetically received, and it was felt that our needs would best be served by a nice joint from a black bullock which was to be killed the next day. The butcher sketched the pedigree of the bullock for several generations—he was of good Scottish stock. His life had been cut short before his prime, and indeed he had never been away from his mother. In short, he was just the bullock to revictual an English household. As we drove south we thought occasionally of the black bullock's sorrowing mother, while the nourishing parcel in its special wrappings swung behind us in the boot. Next morning we opened it up, our mouths watering, and our expectations were not disappointed.

The day after the obsequies were finally completed we went out to buy some English stewing steak. "No steak," said the butcher, his gaze fixed on the roof just above our heads. "Well, then," we said, "what about some mince?" "No mince till tomorrow" he said, switching his tongue from one cheek to the other dispassionately. "Oh," we said, "good morning." "Morning," said the butcher, turning his eyes to the roof above our successors in the queue.

We had come home.

* * *

I am a mental rather than a digital doodler. Doodling during a recent Senate session I realised that I was participating in the perfect setting for a Gilbert and Sullivan masterpiece. *Senatus Sonorus* or *Professors of Padua*, might have been the title. The Principal, of course, would have to be a rich baritone, not too much of this, or yet too much of that. The perfect blend in duet or quartet, yet capable of the powerful solo effort,

> "Free from every kind of passion
> scme solution let us find."

A Lytton would certainly have made something of that dreary chore, "the Minutes of the last Meeting" which could be made quite attractive if delivered by a Clerk of Senate in a fruity tenor complete with glottal stop in the best Italian tradition.

> "That ever knowing,
> overflowing,
> easygoing,
> Senator":

Incidentally, the habit of starting a meeting by going over what happened at the last one, rather like sitting down at a table not yet cleared of the remains of the previous meal, must surely be a national characteristic. It would be interesting to know the procedure in less docile nations, such as the Latin Americas.

But there is one snag. Our Senate remains a male sanctuary, and it is inconceivable that Gilbert would have tolerated an all-male cast. He would have insisted on a female faculty led by the vibrant contralto of a Bertha Lewis. Perhaps fortunately at this point my doodling was cut short by that ever popular chorus "Any other competent business?"

* * *

It was my evening off, so what better pastime than a drink with the Colonel and the local Vet. The telephone rang—a call for the Vet. "Milk fever," he said ruefully, "do you want to come, Doc?" Now this untidy calcium-dumping of Nature has always interested me, though I had never till then seen a case, so I accepted his invitation.

We were greeted by a farmer with a lantern, and in the darkness I was introduced by the Vet as his new assistant. The cow, a heavy Friesian, was lying in what I was told was the usual posture, with head turned over her shoulder. With a dexterity which surprised me because he was looking the other way, the Vet plunged the needle into the jugular vein and a pint of calcium was run in. The next therapeutic procedure was a smart kick on the flank—almost as important as the calcium I was informed. At any rate the patient got up and started to eat.

Next time I shall be a veterinary surgeon; it seems more satisfying somehow.

* * *

We have just attended the annual nurses' prizegiving—known, somewhat surprisingly, as Matron's Wedding. The nurses were ranged in a wide horseshoe, the most junior wearing blue dresses, the next in rank bright pink, and the most senior in new white shiny nylon, their seniority evidently excusing them the starched white aprons of their juniors. Never were there such rigid aprons, such blancoed shoes. In contrast to aprons and shoes, skin and hair were coal black. The hair was oiled until it stood out stiff and straight around the tiny triangle of handkerchief that passed for a cap. The faces were calm, almost indifferent, the hands neatly folded. They looked like a gathering of young nuns.

Sitting by himself was a solitary male nurse. He wore a white blouse high buttoned round the neck, so stiffly starched that it bulged out below the shoulders and gave the impression of a matronly bosom, an impression reinforced by the slender arms emerging from the short sleeves. His black head was small, his shell-rimmed glasses enormous, his moustache flashy, and his bearing inexpressibly solemn.

Later in the evening we saw the same nurses at their dance. They were romping and capering in elaborate evening dresses, and they did not look nearly so nice.

* * *

For a man of 76 with moderate parkinsonism he has attained the ultimate Nirvana of bliss. Although bedfast, his tremor has moderated, his trophic ulcers are healed, his coronary thrombosis is a dim and distant memory, and he is wonderfully looked after by a dutiful daughter. Sitting well-propped up in bed, he looks like a sunburnt Punch, although he has not been in God's fresh air for over six years. Facing him at the foot of the bed is his TV set, the comfort and the terror of his old age.

A true Briton he gets great enjoyment from watching cricket and football matches. Here his prevailing delusion that he also is one of the players does not seem to matter much, but it greatly mars his pleasure in some indoor shows. When it was announced that the next item of a ballet performance by Markova would be the *Dance of the Sugar Plum Fairy*, he cried out in agony, "No, no, I can't do it. I'm too old at 76." Watching a Mansion House dinner is also a trial to him as it would be to any of us if we knew that we had to speak after the Prime Minister—especially if we also shared his secondary delusion that he is only just succeeding by an immense effort in holding up his trousers.

* * *

COPEPOD

I have a little copepod
Who sails a pigmy sea,
And I shall turn a tropepod
As through my microscopepod
His eye looks up at me.
Nor any antelopepod
Who scampers down a slopepod,
Nor prince, nor peer, nor popepod
Is better off than he.
No narrow misanthropepod,
He winks that little eye
As one who would elopepod.
Alas, the little dopepod,
The slide is nearly dry!

Letters to the Editor

TUBERCULOSIS IN CHILDREN

SIR,—Now that the final stages of the antituberculosis campaign in this country come gradually within sight, it becomes necessary, as the Ministry of Health [1] has recently indicated, "to examine closely" our methods and to reinforce them where required.

The arbitrary division of young infected children, into those in whom pulmonary lesions can be seen radiologically and those in whom they cannot, is, for example, no longer justifiable. In infected infants, whilst the child with a visible lesion is possibly somewhat more at risk than if no lesion can be seen, the latter is also in danger. In our official scheme "a person who should be notified as suffering from tuberculosis . . . is a person who because of tuberculous infection may infect others; or a person who is suffering from an active tuberculous lesion which calls for medical treatment or for some modification of the patient's normal course of living." This could be interpreted widely but in practice it is usually only the child with a demonstrable pathological shadow who is notified—and consequently attended to, whilst failure to demonstrate a pulmonary lesion is apparently sufficient reason for optimistic unconcern.

In a recent study [2] my colleagues and I estimated that in the London of 1945–49 there were, on the average, at any one time, 285 infants who were tuberculin-positive. The majority of these might fail to show radiological lesions, but some would die from grave hæmatogenous spread whether they showed radiological shadows or not. We were impressed by the frequency with which these fatal complications arose "out of the blue." In 82 unselected cases of children dying from meningitis and miliary disease no radiological abnormality was detected in the chest in 23. For some weeks or months prior to this illness most of these 23 children would have been called simple tuberculin converters had they been discovered at that stage, and because X-ray examination failed to reveal an abnormality they would have been considered by many as of little account. These children would not have qualified for notification for they had only been "infected." They were not "suffering from" the disease.

On the other hand, many children with obvious and sometimes gross shadows in the chest due to primary tuberculosis are never ill and heal naturally; yet such children tend to be notified and to receive much official care because of the radiological appearances. The process of simple infection is said to have gone a stage further. The child has passed into a different category and is now a case of disease. Clearly this division between "infection" and "disease" has become untenable. Because of this my colleagues and I used the over-all term "primary tuberculous disease" to cover all infected children irrespective of radiological appearances. The majority of these infections are silent. There are no symptoms and, apart from the conversion of the tuberculin reaction, no signs. These are the subclinical cases. Others infected will show abnormalities in the radiological picture due to enlarged mediastinal glands, or a primary complex, or a segmental lesion. Some will develop pleurisy, others miliary disease and meningitis. These complications often arise from a primary complex which is incapable of radiological demonstration. Whilst it may be unusual to use the term "disease" to include subclinical cases, in this instance it appears justifiable, the boundary between infection and disease being in many ways quite unreal. Primary tuberculosis is a common infection, and in the vast majority of cases it is benign; but in a few it gives rise to grave and sometimes fatal complications. Only if we learn to look at tuberculosis in this way are we likely to direct our attack wisely in the final stages of the antituberculosis campaign. Natural (as opposed to B.C.G.) infection in our child population should no longer be considered with indifference. Infection and disease are not two separate entities. Let us have done with the dangerous euphemism that the simple converter has at some time "met the bacillus." Infection is always followed by a disease process even though in the majority this cannot, by our present methods, be radiologically demonstrated.

A plea has recently been made for a new yardstick by which to measure progress in the antituberculosis campaign. Notification-rates and mortality figures are now recognised as insufficient indicators. Is anything likely to be more sensitive and satisfactory than the changing rate of primary infection? A few years ago no less than 40% of our school-leavers were tuberculin-positive. In 1953 the comparable figure for Oslo was 7%.[3] What is it now for England? Ought we not to know? While it may be difficult with our large populations to ascertain all those infected at different ages, surely there should be a continuous effort to do this in properly selected samples?

In a great city like London in the period 1945–49 there were probably somewhat under 100,000 infected children below 15 years of age. The number today is probably considerably less. In another decade the numbers may be small indeed. When they come to light it will be wiser and certainly more scientific to consider all these children as tuberculous. Each case should be carefully assessed and appropriate action taken. If the infection is thought to be of long standing it will generally be sufficient to arrange for periodic radiological examinations at adolescence when the risk of developing chronic pulmonary tuberculosis begins. Children recently infected, or those in whom recent infection is probable, should be supervised for a year or two. The younger the child the more careful is the supervision required. After the early dangerous period has passed these children also will naturally call for renewed radiological control towards puberty, and particularly is this the case in adolescent girls. Girls not only suffer more frequently from chronic pulmonary tuberculosis than do boys, but they miss the safeguard imposed by the radiological check which boys get on presentation for National Service.

Two points remain. I do not pretend to know what in detail should be done about notification. This has been a thorny and difficult problem for some years. The present arrangements are not good enough. The desirability of working out a new administrative scheme to cover the needs of tuberculous children both as regards notification and supervision calls for urgent attention at the appropriate levels. Medical administration has studied this awkward question long enough and a solution should no longer be deferred. The nettle must be grasped and a new plan of attack laid down. Unless all infected children are notified in some suitable way to the chest clinic, not only will the individual child tend to be overlooked but the chest physician cannot, as the Ministry of Health enjoins,[1] put as much effort into "tracing the source of tuberculous infection as is put into finding out the origin of the typhoid outbreak or tracing the contacts of a smallpox patient." The other big question is the proper place of antibiotics. Failing, as seems to be the case, in exerting any demonstrable effect in an established primary complex or a segmental lesion with its associated endobronchial disease, have antibiotics any place in the management of a recently infected child? A trial big enough to provide a full and proper answer would require a very large

1. Circular H.M.(54)30. Prevention of Tuberculosis. See *Lancet*, 1954, i, 816.
2. Bentley, F. J., Grzybowski, S., Benjamin, B. Tuberculosis in Childhood and Adolescence. London, 1954.
3. Garegg, S. Personal communication.

undertaking—much beyond the scope of any individual worker—and I know of no such investigation being conducted at present in this country. Possibly it never will be undertaken. Failing scientific proof we should act prudently with such knowledge as we possess.

Waring [4] has recently advocated the use of chemotherapy in certain recent tuberculin converters "with or without primary lesions." In the present state, or rather lack, of knowledge I incline towards the same view. Certainly, in recently infected infants, antibiotics should be given irrespective of radiological appearances. I am less sure of my ground in older children. Boys and girls over 10 with pleural effusion warrant antibiotics in an attempt to stop the chronic pulmonary tuberculosis that affects far too many of them in later life. Apart from these two fairly well-defined groups (the very young infected infant and the child with pleural effusion), we do not know the total extent of risk run by the tuberculous child, but there is much to be said for an attempt to sterilise the disease process with its potentially dangerous occult hæmatogenous seedlings in every recently infected case, irrespective of age or of radiological findings. All these children would not require institutional treatment but this, together of course with continued education, should be available where particular indications exist.

High Wood Hospital for Children, Brentwood, Essex. F. J. BENTLEY.

PULMONARY STENOSIS

SIR,—We read with great interest your leader of Sept. 11. It occurred to us, however, that in some respects your comments applied only to adolescents and adults. As operation is being performed in childhood with increasing frequency, it seems important that the criteria for operation should be particularly related to this age-group.

You state that inversion of the T wave in the electrocardiogram in the right ventricular surface leads (V_1–V_3) indicates a high right ventricular pressure and is an absolute indication for operation. However, inversion of the T wave is found in V_1 in 96% of those under the age of five and in 89% of those between five and thirteen years of age. In V_3 the corresponding figures are 76% and 30%.[5] Clearly, therefore, the foregoing statement has little significance in this age-group.

You also state that the second sound is either single and diminished or split, with diminution of the pulmonary component. We think that it is worth emphasising that in our experience in children the degree of splitting in mild or moderate cases of pulmonary stenosis may be very distinct—up to 0·1 second—owing to delayed pulmonary-valve closure. This point seems to us important, since a widely split second sound is generally associated with atrial septal defect.

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THE RENAL DUCTS OF BELLINI

SIR,—Dr. Jones and Dr. Rewell are to be congratulated on their communication on this subject (Aug. 7). Their excellent illustration shows clearly two ducts of Bellini opening directly into the renal pelvis, with no evidence of a membrane covering their openings.

Following Dr. Duran-Jorda's [6] observation that he doubted the existence of openings of the ducts of Bellini, I expressed a hope that histological proof would be forthcoming, in addition to demonstration of the openings by 'Neoprene' (latex) injections.[7] Histological proof is not easy to obtain, since routine sections rarely bisect a duct of Bellini longitudinally. I have obtained one section, passing through the whole of an adult renal papilla, which shows a single duct of Bellini opening directly into the pelvis without any covering membrane. The lining epithelium of the pelvis and the duct had desquamated to some extent, and the specimen is not nearly so good as that shown by Jones and Rewell.

Dr. Thung (Sept. 25) now makes further interesting observations, and supplies a beautiful example of ducts of Bellini opening on the papillary tip of a mouse kidney. These recent researches, I think, prove conclusively that the ducts of Bellini open directly into the renal pelvis without membrane formation. The discussion has shown, as Jones and Rewell observe, "how much is still to be learnt, or relearnt, about normal anatomy."

Edinburgh. JAMES A. ROSS.

MEDICAL CARE OF STUDENTS

SIR,—As Dr. Macklin points out (Sept. 25), Dr. Logan's article of Aug. 28 gives a wrong impression of the general aims and objects of most student-health services in this country. It also implies that Manchester is the first university to use a questionnaire. I should like to point out that in Belfast, where a comprehensive student-health scheme was begun in 1948, and compulsory medical examination for freshers and annual chest X-ray examination of all students were first introduced, the questionnaire method was tried out four years ago. Routine medical examination, which the students had not then been offered, was carried out subsequently.

Over six years we have had no defaulters in our routine medical examinations, but 30% did not reply to the questionnaire. At the medical examination 60% of those who failed to reply were found to have some defect which they knew about, but had not wished to reveal on paper. Personal interview showed that the questionnaire was inaccurately answered in most cases, and much less satisfactory than personal interview for assessing character or future reaction to illness or mental stress.

Dr. Logan's figures indicate that in Manchester only 350 students (23·3%) out of 1500 are suspected of having defects. Yet here in Belfast over six years, the number with defects has averaged 80–90%. Can a non-medical assistant, even if highly skilled, accurately assess from a questionnaire the importance of a defect? There surely cannot be so much difference between the students at this university and those at Manchester. The form used at this university shows that more than half the defects found on examination were previously unrecognised by the student, which suggests that only by personal interview and routine examination can all defects be brought to light.

In America, where student-health services have been established for about a hundred years, and comprehensive schemes for well over thirty years, routine medical examination has been found the most efficient method, and is now used in almost all their universities. It is certainly the basis of the student-health service at the University of Minnesota which Dr. Logan mentions.

The student group is a relatively healthy one, and most of the defects found are slight; but their importance lies in their possible development, and particularly in their effect on the individual's mind. The most stable of us have suffered from nosophobia, and we all know the relief of reassurance. This is a most important function of any student-health service, but it will be used only by students who have already met the medical officer, and have confidence in him and in the service.

I agree wholeheartedly with Dr. Macklin's remarks on radiographic screening of students. At this university 18 of the active cases of tuberculosis detected by mass miniature radiography in the past six years were without signs or symptoms; 5, in fact, were prominent athletes. Are we to ignore such cases in the hope they will cure themselves spontaneously, or wait until they present

4. Waring, J. J. *Dis. Chest.* 1954, **25**, 361.
5. Allmurung, M. M., Joseph, L. G., Nadas, A. S., Massell, B. *Circulation*, 1951, **4**, 420.
6. Duran-Jorda, F. *Lancet*, 1953, **1**, 727, 900.
7. Ross, J. A. *Ibid*, pp. 799, 950.

with symptoms? As Dr. Macklin states, mass X-ray examination is simple and inexpensive, and takes only a few moments of the student's time. Admittedly *on paper* the results may not seem dramatic (5–6 cases per 2500 students) but surely the object of a student-health service is to treat the individual as well as the population as a whole, and any method that omits to do so fails in its primary object.

Finally, I must correct Dr. Logan's statement that non-resident students at this university are "largely obliged" to register with the student-health service. This is not the case; our students can register with any doctor they choose, and no pressure is brought to bear on them to register at the student-health centre.

Student Health Service,
Queen's University,
Belfast. WILSON JOHNSTON.

A WORD WANTED

SIR,—If it is not too late to offer a term in response to Dr. Apley's request (April 10) for an antonym to "retrospective," why not simply "antespective"? This has the advantage of syllabic and symphonic balance with retrospective (an advantage not shared by the "prolective, prolative, prospective, or anterospective" which Dr. Apley mentions).

Editorial Department,
Dorland's Illustrated Medical Dictionary,
Philadelphia. JEAN HUSTED.

RAPPORT WITH THE PATIENT

SIR,—Certainly Dr. Meares is to be congratulated on his courage in writing on Rapport with the Patient (Sept. 18)—and how much more impressive a phrase it is than the "Bedside Manner." The trouble is that he sets out to be too didactic and comprehensive. One wonders if perhaps the already over-conscientious young doctor will not become terrified at the complexity required in his own behaviour; and even the older practitioner may well reflect sadly on the damage he has caused in the past (the too hearty handshake . . . the inopportune cigarette . . . the lips pursed over intimations of immorality). Moreover the skill and speed in diagnosis must be remarkable. The first handshake must be graded to the personality, and if too hearty or too cold may do much harm: I must confess that although I have shaken hands for years I cannot yet rely on making such an accurate diagnosis of what the personality requires in that brief moment before I do so. Nor can I sense the past unhappy love experience which would make my welcoming smile out of place.

Moreover, some of his generalisations are surprising: 'uncovering the body . . . means that one is prepared to expose the self." Perhaps, sometimes: but many psychiatrists would feel it sometimes means just the opposite; and many physicians that it means nothing of the sort. "Nudity, when the doctor is a man . . . involves some emotional difficulty in many male patients as well as women." The woman doctor (apparently) has no such difficulty.

But all this is perhaps unfair, for there is a great deal of wisdom in Dr. Meares's paper, and even if our grandfathers knew it all well enough it is probably very wise to recall it to this more materialistic generation. We are quite right to think about it—if we keep some sense of proportion and sense of humour.

University College Hospital,
London. R. F. TREDGOLD.

SIR,—Dr. Meares in his interesting article agrees with W. S. Gilbert that "the thrill of a touch may mean little, or nothing, or much."

As a dermatologist one frequently has the opportunity of holding a patient's hands without arousing strong emotional reactions, and this gives one a chance to observe a sign which I have not seen previously described. On lightly holding the patient's hands one becomes conscious that he or she is pressing or weighing one's own hands down quite heavily. Following any reference to this, the pressure ceases at once. The presence of this sign is always indicative, in my opinion, of a nervously unstable person and suggests a possible psychogenic basis for the skin manifestation.

What the explanation of this is I cannot say. One might suggest that the patient is symbolically clinging to the dermatologist for support. I will, however, leave it to those better qualified than myself to provide the true explanation.

Leeds. F. F. HELLIER.

HAIR IN THE HEEL

SIR,—I was interested to read Dr. Piper's letter (Sept. 25). Last year, a lady consulted me with a black line on the dorsum of her right big toe. After examination under a hand lens, I scratched away the superficial layers of the epidermis and extracted a hair about two inches in length. I did not have the hair examined.

I had not seen or heard of a similar occurrence until I read Dr. Piper's letter, and I wonder whether this is a common condition.

Wroughton, Wilts. W. L. CALNAN.

SIR,—I was most interested in Dr. Piper's letter as I believe the condition he describes to be quite common—though I have not previously seen it referred to in print.

I have on several occasions removed from my own foot hairs from my dog (a Staffordshire bull terrier), and I recall removing what appeared to be an eyebrow hair from the pulp of my left index finger. On each occasion the hair was completely (or nearly completely) embedded in the tissues and caused considerable local discomfort.

Department of Public Health,
Bristol. H. TEMPLE PHILLIPS.

SIR,—Dr. Piper states (Sept. 25): "it is believed to be rare for a hair to penetrate the skin of the heel, which is extremely thick and tough." For the chiropodist, however, this is a fairly common finding. Hairs of varying thickness and length work their way into the thick skin on the ball of the foot and the heel. Slender hairs, such as those on the limbs, often work their way right through the epidermis and lie beneath it neatly coiled; or thick hairs, such as thin bristle or horse-hair, penetrate so deeply that inflammation is set up.

A hair is barbed, the surface cells overlapping in the manner of fish scales. If a hair is rolled between finger and thumb, it will pass between them at right-angles to the rolling movement. It is in this fashion that it passes through the cells of the epidermis. When once it has got a hold on the superficial skin cells, the action of walking does the rest. Sometimes a slender flexible hair will enter the sweat-duct, and as it proceeds downwards it follows the convolutions of the duct. A stouter hair will often penetrate at the interpapillary space and not enter a sweat-duct at all. Hairs also penetrate the skin at all angles, and thickness of skin is no barrier.

West Wickham,
Kent. B. DALTON.

FILMS IN MEDICAL EDUCATION

SIR,—In your issue of Aug. 28, where the importance of the film in medical education is emphasised, I was disappointed to see no mention of sound recording as an aid in teaching.

Just as the student may now never see a case of primary chancre or of tetanus, so he may not hear pericardial friction or feel confident about ægophony or whispered pectoriloquy. Even worse, he may encounter these for the first time in his final examination, where physical signs abound.

Why not make good recordings of the auscultatory signs, which could be played to classes with comments and explanations by the clinician? As a rule, many students can crowd round a bed to see a physical sign, but only the fortunate few can apply their stethoscopes. We must of course in the end bear things for ourselves; but it is an enormous help if we know what to listen for, since even the most elegant verbal description is inadequate.

Technical difficulties in recording these sounds are not great (for instance, the Korotkov sounds have been broadcast over a loudspeaker to physiology classes at the Middlesex Hospital Medical School); and I am quite sure that such recordings, once made, would be widely used. Moreover, something would be handed down to a posterity that may no longer hear Hippocratic succussion, in much the same way that we can now hear on the phonograph the tinny echo of Dame Nellie Melba's voice.

Virus Research Institute,
East African High Commission,
Entebbe, Uganda. CEDRIC MIMS.

TACHYCARDIA DUE TO CHLORPROMAZINE

SIR,—While investigating the use in anæsthesia of chlorpromazine hydrochloride ('Largactil') we have confirmed that severe and prolonged tachycardia may complicate its administration. We have found that the tachycardia can be mitigated and shortened by giving the drug intravenously in divided doses at regular intervals, up to or even in excess of the usual total dose. We have, for example, given a total of 35–70 mg. in divided doses at intervals of ten to fifteen minutes over a period of one to two hours.

W. KIRK RAE
E. HACKER.
London.

LIABILITY FOR ACTS OF DEPUTY

SIR,—In your issue of Sept. 25 a letter from Dr. Eimerl contains a statement which must be refuted: "yet here is a *group of doctors* recommending, *as a body*, that a partner in a partnership practice shall take 'greater care in his deputising arrangements'" (my italics). This pronouncement was not made by a group of doctors as a body, but by a medical services committee, which is a committee consisting of three doctors and three lay members, with an independent chairman. This cannot be called, by any stretch of imagination, a "group of doctors acting as a body."

S. NOY SCOTT
Chairman, Local Medical Committee,
Devon and Exeter.
Plympton.

BRITISH ASSOCIATION AT OXFORD

SIR,—In your annotation (Sept. 11) on this meeting, you mention that on the occasion of the 1860 meeting the then Vice-Chancellor, Dr. Jeune, Master of Pembroke College, "vaguely conscious of some sort of disturbance in the vicinity, sent for the local secretary to ask who Mr. Darwin was and what he had done."

In Sir Humphry Rolleston's obituary of Sir William Church [1] this quest for knowledge is attributed to Dr. F. C. Plumptre, Master of University College, who, during his vice-chancellorship some ten years earlier, had shown a similar ignorance of Thackeray's literary achievements. It would be somewhat surprising if Dr. Jeune, who took a leading part in the first University Commission and was a strong supporter of the Liberal movement, was unaware of the Darwinian concept of evolution, particularly as George Rolleston was a fellow of his college.

I wonder if you have forgotten the advice which another college head, Dr. Routh, gave to Dean Burgon?

Radcliffe Infirmary,
Oxford. A. H. T. ROBB-SMITH.

1. *St. Bart's Hosp. Rep.* 1929, **62**, 1.

TRICHLOROETHYLENE VAPORISER FOR MIDWIVES

SIR,—Since 1946 trichloroethylene ('Trilene') has been administered by trained midwives to over 5000 patients in Guernsey, most of them in the Maternity Hospital. More than 500 of these patients were later anæsthetised fully, in the presence of doctors, for various obstetrical manœuvres. In eight years' experience we have had no untoward incidents, and I believe that the method merits trial on a larger scale.

The apparatus used is a standard Oxford ether vaporiser. By setting the lever at between 2·5% and 7·5% (ether calibration) a concentration of trilene is produced which gives satisfactory analgesia for nearly all patients. It is unnecessary to fill the vaporiser water-jacket with hot water, for the temperature inside the apparatus is probably sufficiently constant to yield a steady flow.

The midwives are instructed on five points:

(1) 7·5% (ether calibration) is the maximum permitted except under direct supervision by a doctor.

(2) They must test the function of the expiratory valve (the thread of which is wrapped with cotton to prevent closure).

(3) They must make sure, by watching the bellows while blowing into the mask, that the non-return valve is working.

(4) They must see that there is trilene in the machine.

(5) They must never leave a stuporous patient.

Our patients made their acquaintance with the machine early in the first stage, when they were calm and collected, and before analgesia was really required. Later on, when they became definitely uncomfortable, they were given the mask with the lever usually set at 4% (ether calibration). This frequently proved adequate until the head began to stretch the perineum, when up to 7·5% (ether calibration) was required. Administration was, of course, intermittent.

My impression is that 95% gained adequate relief. Many had almost complete amnesia of the later stages of labour; others stated that although delivery was painless they knew what was happening, were able to coöperate, and remembered the first cries of their baby. The duration of labour, on the other hand, did appeared to be increased. This I found reassuring, for it means that the midwife tends to give too little rather than too much: she invariably withdraws the trilene if it has inadvertently been pushed to the stage at which coöperation ceases.

A few patients were nauseated by the smell of trilene. Others, who would probably have been difficult subjects for any form of analgesia, refused to keep their masks on their faces, or rapidly became uncontrollable if they did. The remainder who refused were those who had availed themselves of the finest analgesia of all—relaxation.

Since 1946 the forceps-rate at the Maternity Hospital has fallen dramatically, and is now 6%. This decrease cannot, of course, be attributed solely to the introduction of trilene, but the method has undoubtedly reduced the number of forceps deliveries performed for maternal exhaustion.

There were 3 maternal deaths in the series, representing a mortality-rate of 6 per 10,000. (The 1948–49 rate for England and Wales was 10 per 10,000.) None of the 3 deaths could in any way be attributed to anæsthesia. The stillbirth-rate has averaged 17·6 per 1000 (stillbirth-rate for England and Wales 23 per 1000). Postpartum hæmorrhage was no commoner. There were 2 cases of diplopia, which cleared within thirty-six hours. Moderately severe laryngeal spasm was sometimes noted if a painful manœuvre was persisted in before third-stage anæsthesia was well established. Rarely, tachypnœa or bradycardia developed during general anæsthesia, and

when it did I transferred, for the sake of safety, to ether. In seriously shocked and exsanguinated patients I used trilene with an oxygen flow as an introduction to ether.

Patients using gas-and-air analgesia complain that they feel suffocated, it makes their heads throb, it takes too long to act, and it gives no relief unless the mask fits accurately. These defects are not found with trilene. Recovery from trilene is, of course, more prolonged, but a straightforward case usually returns to full consciousness within five minutes of delivery, and a forceps delivery with perineal repair within fifteen minutes. Cyanosis of the baby appeared to me to be less common than with gas and air. Finally, sisters, nurses, and porters are glad to be relieved of the fuss associated with nitrous-oxide cylinders.

A conceivable danger—it has not happened in my experience—is that patients given trilene may fall off the bed while disorientated or stuporous. Nursing staff should be warned not to leave such a patient unattended.

Our first vaporiser cost £50; and our second, obtained from the Army, cost £10. The apparatus could be further cheapened by disposing of the middle jacket of the vaporiser, and probably of the outer jacket also. Trilene cost us 3½*d.* per patient. The standard 100-gallon nitrous oxide cylinder costs 10*s.* 7*d.* to refill, and if we had to use nitrous oxide as freely as we used trilene I think we should use one cylinder for each patient. We have saved over £2000 in the last eight years.

When we introduced this method of analgesia we did so in the belief that a midwife is a responsible person. She is trained to administer gas-and-air analgesia; to give pethidine injections on her own responsibility; to wait for the separation of the placenta; and to judge when help is needed. Surely she is also to be trusted with an apparatus which is dangerous only if used in a culpably negligent manner.

Guernsey. P. S. A. HEYWORTH.

CROSS-MATCHING OF BLOOD IN THE PRESENCE OF DEXTRAN

SIR,—The article by Dr. Marston in your issue of Oct. 2 is especially important because of the increasing use of dextran as a plasma-volume expander. While agreeing with Dr. Marston that in many of the recipients of dextran no difficulty in cross-matching blood arises, I have found it very difficult to differentiate from true agglutination the intense rouleaux which occasionally develop.

Of the last 7000 patients for whom blood has been cross-matched in my department, there have been 31 cases in which the laboratory tests had to be performed with a sample of blood obtained immediately after the infusion of dextran. In 5 of these 31 cases there was intense rouleau formation when the recipient's serum was incubated in tubes at 37°C with homologous ABO and Rh (D) donor red cells suspended in saline and in 20% bovine albumin. It was clear to the trained eye that there was rouleau formation in these cases, but so intense was the rouleau formation that even an experienced laboratory worker would have difficulty in deciding whether there was true agglutination in addition to rouleau formation. Dilution with physiological saline and mechanical pressure by the application of a coverslip failed to break up the tightly packed cells, but the indirect anti-globulin test was negative. Indeed the indirect anti-globulin test has proved invaluable in differentiating between intense rouleau formation and true agglutination.

Apart from difficulty in cross-matching, the prior administration of dextran may occasionally cause difficulty in determining the recipient's blood-group. For example, rapid emergency slide methods of Rh (D) grouping which involve the use of heavy cell suspensions in serum may give dangerous false positive results. Again apparent discrepancies in ABO grouping may arise from marked rouleau formation when the recipient's serum is tested with standard A and B cells.

The occurrence of such difficulties, however infrequent, in grouping and cross-matching stresses the necessity of having these tests performed only by thoroughly trained and experienced staff, and above all emphasises the importance of obtaining, prior to the administration of dextran, a sample of the recipient's blood for subsequent grouping and cross-matching tests.

Giffnoch, Renfrewshire. JOHN WALLACE.

TREATMENT OF PLANTAR WARTS

SIR,—For some years I treated plantar warts by injecting local anæsthetic and then applying carbon-dioxide snow. When the treatment by soaking the feet in weak formalin was introduced, this seemed an excellent way of avoiding pain. The only trouble seemed to be over adequate removal of dead skin and the warts.

I have since been using, with much satisfaction to all concerned, the following technique:

At night, 25% salicylic acid in collodion is applied to the wart or warts, and in the morning the child is encouraged to pick off the dead skin with his finger-nails, assisted, if necessary, by his father with a razor-blade. 10% formaldehyde contained in cotton-wool on the end of a match-stick is then soaked in.

This process is repeated daily, and in my experience over 90% of cases are cured in two to three weeks.

Workington, Cumberland. R. N. R. GRANT.

Appointments

BAYLISS, R. I. S., M.A., M.D. Camb., M.R.C.P.: asst. physician, Westminster Hospital, London.
LLOYD, W. R., M.B. Edin., M.R.C.P.E.: consultant physician (geriatrics), Oldham and district hospital centre.
WALTHO, MARGARET L., M.B. Lond.: appointed factory doctor, Godalming, Surrey.
WOODROFFE, JANET B., M.B. Lpool, D.A.: asst. anæsthetist, Preston Royal Hospitals.

South-Eastern Regional Hospital Board, Scotland:

LAMB, D. W., M.B. Edin., F.R.C.S.E.: S.H.M.O., orthopædic surgery, Princess Margaret Rose Hospital, Edinburgh.
REID, J. D., M.B. Edin., D.P.H., D.T.M.&H., D.C.P.: clinical pathologist, Peel Hospital, near Galashiels.
WHISTON, T. B., M.A., M.B. Edin., F.R.C.S.E.: orthopædic surgeon, Peel Hospital, near Galashiels.

East Anglian Regional Hospital Board:

BURROWS, F. G. O., M.B. Dubl.: surgical registrar, Norfolk and Norwich Hospital.
GREEN, N. A., M.B. Lond.: surgical registrar, Norfolk and Norwich Hospital.
WYNNE, E. J. C., M.B. Camb.: surgical registrar, West Norwich Hospital.

Birmingham Regional Hospital Board:

DAVIES, MURIEL J., M.B. Birm., D.P.M.: asst. psychiatrist (S.H.M.O.), mid-Worcestershire group.
LEYTON, G. B., M.D. Camb., D.PATH.: consultant pathologist, Birmingham (Mental B) group.
LONDON, P. S., M.B.E., M.B. Lond., F.R.C.S.: consultant surgeon, Birmingham (Selly Oak) group.
TRAFFORD, H. S., M.B. Manc., D.OBST., F.R.C.S.E.: senior casualty officer (S.H.M.O.), mid-Worcestershire group.
VALTERIS, KAZIMIERAS, L.M.S.S.A.: asst. pathologist (S.H.M.O.), Herefordshire group.
VEREKER, RICHARD, M.D. N.U.I., D.P.M.: consultant psychiatrist and deputy medical superintendent, St. Edward's Hospital, Cheddleton.
ZALESKI, W. A., M.B. Polish School of Medicine, D.P.M.: consultant psychiatrist and deputy medical superintendent, Lea Colony, Bromsgrove, and Lea Castle Colony, Kidderminster.

Colonial Medical Service

ABOUD, K. M., M.B., D.T.M.&H., D.C.H.: M.O., Sierra Leone.
FAWCETT, K. J. R., M.B. Brist.: M.O., Tristan da Cunha.
HAMILTON, D., B.M. Oxfd, F.R.C.S.: special grade M.O., Uganda.
HERDERSCHEE, D., M.D.: M.O., Gold Coast.
MOORE, Q. S., M.B. Edin.: M.O., Northern Rhodesia.
PURSER, J. R., M.B. N.U.I.: M.O., Nigeria.
ROGERS, H. C., M.D. Prince Edward Island: M.O., Barbados.
SHEARE, M. M., M.B., D.P.H.: M.O., grade B, Trinidad.
TURNER, P. P., M.D. Lond., M.R.C.P.: M.O., Kenya.
VELLA, JOHN, M.D. Malta, D.L.O.: M.O., Tanganyika.
WALTERS, G. E., M.B. Calcutta: M.O., British Honduras.

Obituary

FREDERIC WOOD JONES

M.B., D.Sc. Lond., F.R.C.S., F.R.A.C.S., F.R.S.

Professor Wood Jones, anthropologist and anatomist, died on Sept. 29 at the age of 75. In his lifetime he had grasped and interpreted so wide a knowledge of man and his surroundings that few scientists could approach him for breadth of learning. And he had turned it all to such good account that no-one who came under his influence could fail to be the better for the experience. Without this gift for influencing others, mere learning, however prodigious, is sterile: and Wood Jones had a gift that placed him in the first rank of teachers.

Frederic Wood Jones was born in London in 1879. He studied medicine at the London Hospital, and took the B.SC. in 1903 and the M.B. in the following year. He then spent two years as a medical officer in the Cocos-Keeling islands, before taking up an appointment as anthropologist to the Egyptian Archæological Survey of Nubia. He came home in 1909 to become lecturer in anatomy at Manchester University, and from 1910 to 1912 he was demonstrator of anatomy at the London and St. Thomas's. At that time he took his doctorate of science in zoology.

[Dominion Press

During the 1914–18 war, he served in the R.A.M.C., but he was able to act as Arris and Gale lecturer at the Royal College of Surgeons from 1914 to 1916 and again in 1919, the year in which he was appointed professor of anatomy at the London School of Medicine for Women. Quite soon he was offered the chair of anatomy in the University of Adelaide, and no doubt the opportunity to extend his anthropological studies in a new continent was one of the prospects that encouraged him to go. He stayed in Australia until 1927 when he became Rockefeller professor of physical anthropology in the University of Hawaii at Honolulu.

In 1930 he returned to Australia as professor of anatomy at Melbourne, where he taught for seven years, except for a time in 1932–33 when he was temporary director of anatomy at the Peiping Union Medical College. In 1937 he came back to England and the chair of anatomy at Manchester, which he held until 1945. He was then appointed first Sir William Collins professor of anatomy at the Royal College of Surgeons, and he stayed at the college until his death—from 1952 as honorary curator of the Hunterian Collection.

He wrote a great deal on the scientific and occasionally on the not so scientific, and his published works show clearly the agility and breadth of his accomplishments. R. J. L., student and colleague of Wood Jones, writes:

> The world's outstanding comparative anatomist and morphologist, Wood Jones was very much more than an expert in this particular field. The breadth of his scientific knowledge was immense. It covered not only the whole gamut of zoology from anthropology to invertebrate anatomy, but also included a close acquaintance with palæontology, botany, geology, and astronomy. He knew probably as much of the whole cosmos as one man ever could. To the end of his life, his memory was encyclopædic, and if he occasionally forgot some small fact he had an uncanny facility for quoting the exact reference of the paper where it could be found.
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> The breadth of his factual knowledge was matched by a depth of insight that is given to few men. His mind had a power of synthetic reasoning which is found very rarely in scientific thought. Not for him the narrow confines of an experiment or two: he was far more concerned with penetrating the hidden secrets of Nature and trying to see them as a whole, adding his own experience to the observations and writings of others in the construction of a composite picture of the universe.
>
> An evolutionist at heart, he did not subscribe fully to the theories of either Darwin or Lamarck. Though he believed in the inheritance of acquired characteristics he never lost sight of the fact that evolution was a theory and not a proven fact. His clear thinking easily separated established fact from supposition, and he had a very open mind on matters that were still speculative. "How did a bat survive when it was half a bat, unable to walk or fly?" was a typical comment on the theory of natural selection. By mixing fact and speculation in an inextricable complexity he could readily have propounded a well-sounding theory of evolution that would have gained many adherents; but he was too honest to clothe ignorance in words. If, in his written works, he advanced no such new theory, he often cast doubt on the old. True he left no new system of philosophy that will be known by his name, but the influence of his ideas has been so wide that it has affected the understanding of anatomy and indirectly coloured the thoughts of many anatomists who never knew him.
>
> With it all Wood Jones was very, very human. He was a tolerant man, whether one agreed with him or not, being impatient only of the stupid, and hostile only to the insincere. He had a puckish wit, with which he delighted in pricking the balloons of the pompous, and he could crush an impostor to knowledge with a single telling phrase. He delighted in the company of his fellow men, enjoying food, drink, and good conversation with the best of them. The sparkling unexpectedness of his ideas and his appreciation of the commonplace things of everyday life made association with him a constant joy. The extraordinary range of his ideas is shown in some way in his *Unscientific Essays* and *Unscientific Excursions*, where the scientist is at rest from science, but still bringing his brilliant mind to bear on a host of simple things. He was a gifted artist, and the beautiful line drawings in his books bear witness to a skill that was also brought out in the original diagrams with which his lectures were illustrated.
>
> Wood Jones taught Human Anatomy for much of his life. His many thousands of past students will remember how fascinating the subject became when viewed through his eyes. They will remember, too, the influence he exerted on the shaping of their minds. That the influence was profound and lasting is indicated by the constant stream of former students and colleagues from all parts of the world who were so eager to visit him during the post-war years in London. His finest memorial will be that the impact of his personality has imprinted itself upon the minds of so many.

This impact was perhaps most forcible during his years at the Royal College of Surgeons, and F. S. G., who knew him then, recalls the spell that Wood Jones cast in such a friendly way:

> The scientific world has lost one of its most original thinkers. To a great range of problems both within and without the fields of medicine, Wood Jones brought a tireless and inquiring mind. The freshness of his approach dimmed little, if at all, over a period of fifty years. Rarely accepting the obvious, he had a gift for provoking fresh and often profitable thought in those around him.
>
> He was thus a stimulating teacher, and few of his pupils regarded anatomy as the dreary subject it is often considered to be. This was not achieved by oversimplification or by the use of other disciplines thinly disguised as anatomy: for the exponents of both these schools Wood Jones had a lively contempt, which he expressed with clarity and vigour.
>
> He had a remarkable gift for making and retaining friendships—a capacity unhindered by differences in age and race. To his small room at the Royal College of Surgeons came a stream of visitors from all corners of the earth, some older than he, many young enough to be his grandchildren. With all he had common interests, not least with the young, who forgot age and eminence in the face of such lively informality. Many visitors had reason to remember acts of kindness readily given but anxiously concealed.

Quick, witty, often mischievous, he was the best of company, and no gathering was dull if he was there. On pomposity, dullness, and hypocrisy he was severe; but most men shone more readily under the stimulus he provided.

Almost to the last he retained the same youthful spirit, making it difficult for his many friends to believe that he has told his last joke and hurled his last dart.

He is survived by his wife, Gertrude Clunies, daughter of the late George Clunies-Ross, Governor of the Cocos-Keeling Islands.

JANET MARY CAMPBELL

D.B.E., M.D., M.S. Lond., Hon. D.Hy. Durh., J.P.

Dame Janet Campbell died in London on Sept. 27, after a long illness, at the age of 77.

The daughter of George Campbell, of Barnham, Suffolk, she got her medical training at the London School of Medicine for Women and graduated as M.B. in 1901. After house-appointments at the Royal Free Hospital, she became senior resident medical officer at the Belgrave Hospital for Children. At this early stage, she gave proof of her brilliance by acquiring the London M.D. in 1904 and the M.S. in 1905. At this stage, too, she deliberately decided to devote herself wholeheartedly to her profession.

[Press Portrait Bureau

In considering what work to do, she was attracted by the School Medical Service. James Kerr and C. J. Thomas were building it up in London, and in 1905 she, along with nine others, was appointed part-time assistant school medical inspector under the London County Council. Three years later, after the enactment of the Education (Administrative Provisions) Act, 1907, and the appointment of George Newman as first chief medical officer of the Board of Education, she left the service of the L.C.C. to become the first whole-time woman medical officer of the board, where her colleagues were R. H. Crowley and Alfred Eichholz. Thus began a close official relationship with Sir George Newman which lasted until her retirement from the public service in 1934.

Infant mortality had been a black spot in the national statistics, and in 1901–10 the average figure was still about 128 per 1000 births. In 1907 the Board of Education was empowered to give grants-in-aid for educational work in infant welfare and later for "schools for mothers." Sir George Newman had already published his *Infant Mortality*, and in initiating teaching and work on this subject he greatly relied upon Dr. Campbell. In 1910 she prepared suggestions for teaching the subject in schools and she was largely concerned with the development of schools for mothers and nursery schools. At the same time Sir Arthur Newsholme at the Local Government Board was pressing his department to establish a maternity and child-welfare service: in fact the two departments appeared to be in competition with one another in promoting schemes for infant welfare. This was adjusted by a decision in July, 1914, which defined and sanctioned the continuance of their dual work, while the Local Government Board was empowered to give grants to local authorities to the extent of 50% of their approved expenditure.

After the outbreak of the first world war Dr. Campbell's talents were used in wider fields. The influx of women into war factories gave rise to many problems, and she did pioneer work in industrial medicine. She was a member of the medical committee of the Health of Munition Workers' Committee, of the War Cabinet Committee on Women in Industry, and of the Women's Committee of the Liquor Control Board. In 1919, on the establishment of the Ministry of Health, her chief, Sir George Newman, became its first chief medical officer, combining this with his previous office at the Board of Education. He took Dr. Campbell with him to the Ministry as senior medical officer for maternity and child welfare, and at the Board of Education she was chief woman medical adviser. For these new responsibilities her background fitted her admirably. In 1917 she had written for the Carnegie United Kingdom Trust an outstanding report on the Physical Welfare of Mothers and Children.

Every opportunity given by her official position was used for thorough investigation of maternity and child-welfare work. She was indefatigable in visiting maternity and children's hospitals and units in all parts of the country, as well as the school medical and maternity and child-welfare work of local authorities. Her reports were always concise and constructive. Their subjects included the teaching of obstetrics and gynæcology in medical schools (1923), the training of midwives (1923), maternal mortality (1924), protection of motherhood (1927), and infant mortality (1929). These reports were followed, in 1932, by one on high maternal mortality in certain areas, and in 1935, after her retirement, by a comprehensive account of the maternity services. She was an active member of the Committee on the Recruitment and Training of Midwives, which reported in 1929, and of the Departmental Committee of 1933 on Hospital Construction. On the international plane she served on the Health Committee of the League of Nations.

The country owes her a deep debt of gratitude (writes W. A. D.). She followed up the work of Sir Arthur Newsholme in the field of maternity and child welfare by close personal investigation at the local level and demonstrated exactly how maternal and infant mortality could be reduced. She campaigned for it and, with the powerful aid of Newman, achieved results. The pioneers of those days are no longer with us. She was almost the last survivor of the builders of our school health and maternity and child-welfare services. Memory is short, and it is well to recall, at the moment of her departure, who it was who drew the plans and prepared the specification for the administrative structure and the techniques which have enabled us to save the lives of many thousands of our mothers and our children. They know not to whom they owe their survival. But we, who do know, cherish the memory of one who played a major part in this triumphant story.

An important part of her official duties was to receive deputations and to inspect the work of local authorities and of hospitals, and for this she had a flair. Though somewhat reserved in manner, she was a good and sympathetic listener. If she could not agree, or if she had criticisms or suggestions to make, she could speak in a way that disarmed antagonism and evoked a desire to do what she wished. In committee she was outstanding. She seldom obtruded her opinions, but when asked a question she always knew the answer. If she felt strongly about anything, she would present a short memorandum; or, having waited until the rival views had been expressed at length, and their exponents had exhausted themselves, she would give her own in a form with which the committee almost always agreed.

Distinguished and elegant in appearance, she was tall and good-looking, and retained her comparatively youthful appearance well into middle age. As befitted an advocate of physical training, she always seemed fit and was fond of exercise, especially riding.

M. H. writes: It was a delight to work under her. The organisation of a vigorously progressive maternity and child-welfare service meant hard work for everyone concerned. This she demanded, but she never spared herself; she had an intimate personal knowledge of what was being done by each local authority and of their proposals for extension or alteration. She always kept a close watch on temporary or expedient measures which were ill-advisedly threatening to become permanent.

It was not only her charming, rather diffident manner, her good looks, and her well-turned-out appearance which attracted respect and admiration. She had a clear, capable brain, sound knowledge, and an ability to get a quick all-round grasp of a problem. Also she was approachable. Her wise, considered opinion and advice were sought by medical officers, authorities, and organisations far beyond the confines of the United Kingdom.

In 1934 she married the late Mr. Michael Heseltine, registrar of the General Medical Council; and, under the rules then prevailing, her marriage meant that she must leave the Civil Service. But she continued her interest in all the problems of her working life. She played an

active part in the Medical Women's Federation and was appointed a justice of the peace for Surrey and also for Gloucestershire, where she was then living. What spare time she had was for many years given to her garden, where she had a fine collection of roses. Books and the theatre were always a joy to her and she seldom missed a good play. She had been created D.B.E. in 1924.

Her work is summed up by her former colleague, A. S. MacN., in these words: "She devoted her life to the welfare of mothers and children. She would have desired no other epitaph."

CHARLES McINTOSH MARSHALL

M.B. N.Z., F.R.C.S.

Mr. C. M. Marshall, senior assistant surgeon to the Liverpool Maternity Hospital, and to the Women's Hospital, Liverpool, died on Sept. 21 at the age of 53.

He was born in Invercargill, New Zealand, and he was educated at Southland Boys' High School, where he showed talent for literature and languages. He began his medical training in the University of Otago, Dunedin, and he graduated M.B. in 1923. After spending two years in resident posts in New Zealand, he came to London, where as house-surgeon to All Saints' Hospital he acquired great interest and skill in urological surgery. But after taking the F.R.C.S. in 1928 he turned to obstetrics and became in turn resident surgical officer to Chelsea Hospital for Women and senior resident medical officer to the City of London Maternity Hospital.

In 1932 he moved to Liverpool on his appointment as resident obstetric assistant and tutor to the Liverpool Maternity Hospital and the University of Liverpool jointly. Three years later he was appointed assistant surgeon to the Maternity Hospital. His operative skill and teaching ability soon made his work known, and he travelled widely and wrote extensively. In 1951 he was visiting professor to the Abassia Faculty of Medicine in Cairo and the Farouk I University in Alexandria. The same year he also delivered the Joseph Price oration to the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons. He was an external examiner for the University of Dublin.

F. J. H. writes: "Charles Marshall's rapid ascendency as a leader of thought in his specialty in no way changed his engaging and unaffected nature. He hated intellectual dishonesty and pretentiousness, and he was always as ready to help the student as to join his colleagues in important discussions. Although cut off at the height of his powers he had already made an astonishing contribution to obstetrics and gynæcology, and few have accomplished so much in so short a time.

"Marshall was a gifted speaker and lecturer, but his literary abilities were outstanding. The value of his writings lay not only in the subject matter, but also in his mastery of prose. His was a truly cultured mind enriched since boyhood by a knowledge and love of literature. Behind his shy, reserved manner his friends knew a man generous and kind, brimming with humour, and possessing many endearing foibles. He faced the end with courage and confidence, and sustained by a simple but profound faith he was able to alleviate the sorrow even of those who visited him during his last days. His life and the manner of his death will remain an inspiration and a challenge."

Mr. Marshall leaves a widow and a son and daughter.

HAROLD ROBERT DACRE SPITTA

M.V.O., M.D. Durh.

Dr. Harold Spitta, formerly bacteriologist to the households of King Edward VII and King George V, died in London on Sept. 30 at the age of 76.

The son of Dr. Edmund Spitta, he was born at Clapham, and was educated at Framlingham College, the University of Durham, University College, London, and St. George's Hospital. Having graduated M.B. with honours at Durham in 1900, he took the D.P.H. at Cambridge in the following year, and in 1902 was appointed assistant bacteriologist to St. George's; later he also joined the staffs of the Grosvenor Hospital for Women, the Metropolitan Hospital, and King Edward VII Hospital for Officers, and he was an examiner for the Royal College of Surgeons. In 1908 he became bacteriologist to the household of King Edward VII, and he afterwards held the same position in the households of King George V, Queen Alexandra, and Princess Beatrice. He was appointed M.V.O. in 1914.

A. F. writes: "Harold Spitta was a most devoted son of St. George's Hospital. Like his father before him, he was a student in the days when all the preclinical subjects of the curriculum were taught in the school and he ever retained an affectionate attachment to it. Qualifying at the turn of the century he soon turned to the study of clinical pathology, then still a new field, and quickly became an expert in his chosen branch of medicine. He had been a pupil and friend of the late Dr. Slater, who as one of the pioneers in the subject started the bacteriological department at St. George's. Spitta's father, who was in general practice at Clapham and was well known as an ardent amateur microscopist, was a friend and old fellow student of Sir Francis Laking, famous as King Edward VII's personal physician, and it was at least partly through Laking's support that Spitta so rapidly acquired a large practice in clinical pathology. He was for some years bacteriologist to the hospital, but the claims of his practice made it necessary for him to retire from his hospital work at a comparatively early age. He continued, however, for many years to be responsible for the teaching of bacteriology and public health in the medical school and was allowed by the hospital to retain a small laboratory there for his private use. From the early 1920s until the National Health Service came into being he served on the old house committee of the hospital, of which he was a most regular attendant and a valued counsellor. By his personal exertions he was successful in raising considerable sums of money for hospital purposes. For as long as one can remember him, and indeed until his fatal illness seized him, he retained a youthful body and mind, and a zest for life and work. At his home in Bolton Street (before the war) he loved to entertain his friends. Generous in his help for good causes and for hard cases as he was lavish in his private hospitality, he never failed to respond to appeals for his personal efforts."

In 1904 Dr. Spitta married Sybil Howard, daughter of Colonel Salusbury Crookenden, and she survives him.

Brigadier DAVID FETTES

Sir Heneage Ogilvie writes:

I first met David Fettes in the Middle East in 1942, when he was consulting surgeon to the adjacent Persia and Iraq Force, and I kept in touch with him till his death. I had an admiration for him as a surgeon and an affection for him as a man that I would confess to feeling for few people.

In Egypt, Palestine, and Syria we visited hospitals together, and I can never be sufficiently thankful for all that he taught me. We examined problem cases, we discussed the many matters of surgical method and administration that were facing us at the time in a war of rapid movement when chemotherapy was just being born, and the still more difficult ones that would arise if (as then seemed very likely) Stalingrad should fall, and our two armies would be combining to check a thrust to the South and East.

Later I worked with him when he was consulting surgeon to the War Office. He was an admirable surgeon. He was an excellent operator, sure and gentle. He was a first-rate clinician, careful in examining, judicial, wise in his advice, yet always ready to ask the opinion of others with a diffidence that was a little alarming till one knew that it was the sincere expression of a genuine modesty. Because he was such a good surgeon, because he brought to his task the specialised knowledge of a soldier, because he was such a charming man, so kindly, unselfish, and sincere, he was the ideal consulting surgeon—a post that demands just these qualities. He will be missed by all those who were privileged to know him as a colleague or to work under him in Persia or at Millbank, and by none more than me.

Notes and News

GROUP PRACTICE LOANS COMMITTEE

A TOTAL of 90 applications for loans from the Group Practice Loans Fund has so far been received from groups of practitioners in England and Wales. Payment of a loan has been approved in principle in respect of 30 applications, the total sum involved being of the order of £135,000. Of the remaining applications, 43 have been rejected, 2 have been withdrawn and 15 are still under consideration by the committee.

Medical representatives of the committee have paid visits to the practices of over 40 groups who made application for a loan.

COMPLEMENTARY

WHICH is superior—the key or the lock? The question cannot be answered by dilating on the intricacy of the lock or the noble simplicity of the key, for the plain fact is that neither is of much use without the other. They are different in design, certainly, and capable of quite different achievements, even outside their ordinary sphere: thus you can, if you wish, use a key to stir your coffee, or you may find it convenient to throw a lock at somebody's head. But it would be a carping sort of mind that claimed permanent superiority for locks on the grounds that keys make contemptible missiles, or for keys because locks are a total loss as coffee-spoons.

In his introduction to *Woman: Man's Equal*? [1] Sir Adolphe Abrahams makes the same point. "Man and Woman," he says, "are complementary; femininity and masculinity are basically different, there is no question of superiority or inferiority." It is therefore disappointing to find in the pages which follow so many unsupported statements, not only about women but about men, and so little objective attempt to define the ways in which the sexes complement each other. Thus, in the chapter on "Woman as Delinquent and Criminal" he quotes the opinion of Lombroso that "Rarely is a female wicked, but when she is she surpasses man"; whereas it would have been simple to refer the reader to the annual reports of the Commissioners of Prisons which show not only that far fewer women are convicted of crimes than men, but that on the whole their crimes are milder. Again, when he asserts that *all* women who are famous for conspicuous mental ability reveal some of the anatomical characteristics of the male, and are of a sexually intermediate type with a preference for male attire, are we to suspect Mme Curie and Miss Nightingale, two of the best brains of the 19th century, of such unfeminine attributes?

Such is the ease of his pen, however, that this little book can be read pleasantly even by those who find that some of his statements cause their eyebrows to rise.

University of Durham

At a recent examination for the diploma in psychological medicine C. F. Lascelles was successful.

Royal College of Physicians of London

On Tuesday, Oct. 26, Dr. E. F. Scowen will deliver the Langdon-Brown lecture, on Endocrine Factors in Breast Cancer. On Thursday, Nov. 11, Dr. F. H. K. Green will deliver the Bradshaw lecture, on the Clinical Evaluation of Remedies. Both lectures will be given at 5 P.M. at the college, Pall Mall East, S.W.1.

College of General Practitioners

The first James Mackenzie lecture is to be given by Dr. W. N. Pickles, president of the college, at 11.30 A.M. on Saturday, Nov. 20, at B.M.A. House, Tavistock Square, London, W.C.1. Dr. Pickles will speak on Epidemiology in Country Practice.

The second annual general meeting of the college will be held at B.M.A. House at 2 P.M. on Saturday, Nov. 20.

Society of Apothecaries of London

The Master's Day Service will be held at the Church of St. Mary Aldermary (opposite Mansion House station) on Sunday, Oct. 24, at 11.15 A.M.

A course of ten postgraduate lectures on Modern Methods in Treatment is to be given in the society's hall, Black Friars Lane, Queen Victoria Street, E.C.4, at 4.30 and 5.45 P.M. on Nov. 2, 4, 8, 10, and 16. Admission will be free without ticket, and the lectures will be open to senior students.

1. London: Christopher Johnson. 1954. Pp. 176. 10*s*. 6*d*.

West Midlands Physicians Association

A meeting of this association will be held at Selly Oak Hospital, Birmingham, on Saturday, Oct. 30, at 11 A.M.

West End Hospital for Neurology and Neurosurgery

A series of clinical demonstrations in neurology is to be given at this hospital, 40, Marylebone Lane, London, W.1, at 5.30 P.M. each Tuesday from Oct. 12 to Dec. 14.

University College Hospital Medical School, London

Postgraduate lectures and demonstrations will be given at the school on Oct. 28 and 29. The annual dinner of past and present students will be held at the Savoy Hotel on Friday, Oct. 29, at 7.30 P.M.

Postgraduate Course in Orthopædics

The British Orthopædic Association is holding a course at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, on Thursday, Oct. 21, before its annual meeting on Oct. 22 and 23. The course is open to all who are interested.

National Food Survey of Great Britain

The Nutrition Society is holding a symposium on this subject at the Middlesex Hospital Medical School, London, W.1, on Saturday, Nov. 20. Further particulars may be had from Mr. R. J. L. Allen, c/o Monkhouse & Glasscock Ltd., Snowsfields, S.E.1.

British Hospitals Contributory Schemes Association

At a conference of this association to be held in the great hall of the University of Bristol at 10 A.M. on Friday, Nov. 5, Lord Beveridge will speak on the Rôle of the Individual in Health Service. Tickets may be obtained from the hon. secretary of the association, Royal London House, Bristol, 1.

British Association of Allergists

At a meeting to be held in the Wright-Fleming Institute, St. Mary's Hospital, London, on Oct. 22 and 23, members of the staff of the hospital will discuss polyarteritis. The agenda also includes papers on Mass Experiments on Pollens (Dr. J. Freeman) and on the Relationship of Specific and Non-specific Factors in the Tuberculin Reaction (Dr. J. Pepys).

King's College Hospital Medical School

The annual dinner of this school, held at the Royal College of Surgeons on Oct. 2, was attended by 160 past and present students and guests. Dr. Charles Newman, dean of the Postgraduate Medical School of London, proposed The School, and Dr. Vernon Hall replied. Sir William Gilliatt, proposing The Guests, referred to their loyal service to the school in many capacities. The speeches on this domestic occasion were informal and were warmly received.

Middlesex Hospital Medical School

At this school's annual dinner, on Oct. 1, speakers referred with regret to the retirement of Sir Harold Boldero, who has been dean for the past twenty years. Prof. R. W. Scarff, the chairman, told not only of academic but also of extracurricular successes in the past year, during which the nurses have won the inter-hospitals tennis cup outright for the third time, and the Middlesex has again won the inter-hospitals competition for the best-kept garden. The Chairman was especially content to call on the company to drink to The Hospital and Medical School in view of a recent report that carcinogenesis in mice is delayed and possibly partly prevented by the consumption of alcohol. Prof. B. W. Windeyer, the new dean, and Dr. D. C. F. Muir, the senior Broderip scholar, replied. Professor Windeyer pointed out that Sir Harold Boldero had held office for over a sixth of the school's corporate life. He had sustained the standard of teaching in the difficult war years, and since then had exercised his influence in many spheres on behalf of the teaching hospitals. "He is the best committee man I have ever seen." Dr. Muir, on behalf of the younger generation, declared that Sir Harold always found time to encourage those under him. He went on to talk ruefully of students' disinclination to engage in corporate activities. He had helped to run the second hockey XI, but had met with no great enthusiasm for this enterprise. Surely, he said, the man who did not interest himself in the life of the hospital was unlikely to interest himself in medicine. Mr. D. H. Patey rose cheerfully, with "the English summer safely behind us," to propose The Chairman, who, he pointed out, had been hon. scientific secretary of the British Empire Cancer Campaign and had that day been appointed hon. secretary.

Postgraduate Courses for General Practitioners

A series of one-day symposia for general practitioners has been arranged by Cambridge University Medical School. They will be held on Saturdays during the coming academic year, starting at 10.30 A.M. and ending at 4.30–5 P.M. Each symposium will consist of 3–5 lecture-discussions and demonstrations either of clinical cases or to illustrate modern methods. Further information may be obtained from the Secretary, The Medical School, Tennis Court Road, Cambridge.

Life Insurance Medical Research Fund of Australia and New Zealand

This fund, which was established in 1952 to promote research on the diseases of the heart and blood-vessels, has announced the following grants-in-aid for 1954, amounting to about £25,000:

Clinical Research Unit, Alfred Hospital, Melbourne: for two research projects, under the direction of Dr. T. E. Lowe, on the frequency analysis of cardiac vibrations (sounds) and energy production in the myocardium.

Department of Pathology, University of Melbourne: for research, under the direction of Prof. E. S. J. King, on dissecting aneurysm of aorta (effects of a chemical substance present in seeds of *Lathyrus odoratus*).

Department of Pathology, University of Sydney: for research, under the direction of Prof. F. R. Magarey, into the rôle of hypertension in arterial degeneration and in atherosclerosis.

Department of Pharmacology, University of Sydney: for research, under the direction of Prof. R. H. Thorp, on electrical activity during cardiac contraction and the influence of drugs thereon.

Hallstrom Institute of Cardiology, Royal Prince Alfred Hospital, Sydney: for the purchase of equipment for research, under the direction of Dr. B. Sinclair-Smith, on pulmonary insufficiency and pathological lung changes in patients with mitral stenosis.

Clinical Research Unit, Royal Prince Alfred Hospital, Sydney: for research, under the direction of Dr. C. R. B. Blackburn, on portal hypertension.

Department of Medicine, University of Otago, New Zealand: for research under the direction of Prof. F. H. Smirk, on cardiodynamics, including pathogenesis and treatment of hypertension.

British Medical Association

Doctors in the British Commonwealth and Empire are invited to submit, before Dec. 31, essays for the Katherine Bishop Harman Prize which was founded to encourage "research into the disorders incident to maternity." The value of the prize is £75, and further particulars may be had from the secretary of the association, B.M.A. House, Tavistock Square, London, W.C.1.

London Nursing Exhibition

This exhibition, under the auspices of the *Nursing Mirror*, is to be held at Seymour Hall, London, W.1, from Oct. 11 to 15. At 10.15 A.M. on the 11th, Mr. A. A. Gemmell, F.R.C.O.G., will deliver a Blackham lecture, entitled A Hundred Years Ago. At 12.30 P.M. the conference of professional nurses and midwives will be officially opened by Lady Churchill.

Clinic for Treatment of Varicose Veins

A "varicose-ulcer" clinic is to be opened at the Battersea Central Mission, London, on Wednesday, Oct. 20, by Sir Arthur Porritt. At this clinic, which will be under the direction of Dr. Stanley Rivlin, it is proposed to keep a complete photographic record of the progress of ulcers, and to chart ulcers routinely at each visit. A separate department will obtain follow-up figures yearly up to five years.

Home for Backward Children

The home for backward children established by St. Christopher's Trust at Redcourt, Glossop (see *Lancet*, 1954, i, 839), is to be officially opened on Saturday, Oct. 16, by the Duke of Devonshire, patron of the Trust. The home, which is maintained at present by voluntary subscriptions, caters for girls up to the age of 16 and for boys up to the age of 14. A further home, to accommodate young people beyond these ages, is to be opened as soon as the Trust has obtained enough money.

Diary of the Week

OCT. 10 TO 16

Monday, 11th

INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, W.C.1
5.30 P.M. Dr. M. J. McArdle: Disorders of Ocular Movements of Infranuclear Origin.

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY, Chelsea Hospital for Women, Dovehouse Street, S.W.3
4.30 P.M. Prof. W. C. W. Nixon: Tumours Complicating Pregnancy.

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, Cavendish Square, W.1
8.30 P.M. Sir Horace Evans: Bedside Bias. (Presidential address.)

Tuesday, 12th

UNIVERSITY OF LONDON
5.30 P.M. (St. Mary's Hospital Medical School, Paddington, W.2.) Dr. Arpad Csapo (Carnegie Institution of Washington): Myometrial Function and its Endocrine Regulation.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Psychiatry.* Dr. W. Mayer Gross: Clinical Research in Psychiatry—Retrospect and Prospect. (Presidential address.)

INSTITUTE OF DERMATOLOGY, St. John's Hospital, Lisle Street, W.C.2
5.30 P.M. Dr. C. O. Carter: Genetics in Dermatology.

CHELSEA CLINICAL SOCIETY
8.30 P.M. (Rembrandt Hotel, Thurloe Place, S.W.7.) Mr. Kenneth Walker: Six Problems in General Practice.

Wednesday, 13th

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
2 P.M. Dr. A. Neuberger: Porphyrin Metabolism.

ROYAL SOCIETY OF MEDICINE
4.30 P.M. *Physical Medicine.* Dr. Temple Fay (Philadelphia), Dr. J. B. Stewart, Dr. W. F. Dunham: Physical Medicine and the Care of Cerebral Palsies.
8.30 P.M. *Surgery.* Mr. Harold Edwards: Observations on Splenectomy in Disorders of the Blood. (Presidential address.)

BIRMINGHAM MEDICAL INSTITUTE, 154, Great Charles Street, Birmingham, 3
6 P.M. *Psychiatry.* Dr. H. J. Eysenck: A Theory of Anxiety and Hysteria.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. I. Whimster: Normal and Abnormal Embryology in the Skin.

Thursday, 14th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Dr. Oswaldo P. Campos (Brazil): One Thousand Cases of Bone and Joint Tuberculosis. (Moynihan lecture.)

ROYAL SOCIETY OF MEDICINE
5 P.M. *Ophthalmology.* Mr. D. P. Choyce: Ocular Leprosy. Dr. John Lowe: Some General Aspects of Leprosy.

ROYAL ARMY MEDICAL COLLEGE, Millbank, S.W.1
5 P.M. Dr. J. R. Rees: Significance of Psychiatry.

LONDON HOSPITAL MEDICAL COLLEGE, Turner Street, E.1
5 P.M. Mr. Alan Perry: Some Surgical Aspects of Anæmia. (Schorstein memorial lecture.)

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, W.1
8 P.M. Dr. M. Lederman: Some Applications of Radioactive Isotopes in Ophthalmology. Mr. N. G. Trott, PH.D., and Mr. W. K. Sinclair, M.SC.: Construction and Measurement of Beta-ray Applicators for use in Ophthalmology. Mr. G. S. Innes and Dr. I. G. Williams: Physical and Clinical Applications of Cobalt 60 in the Treatment of Glioma of the Retina.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. R. W. Riddell: The Structure of Pathogenic Fungi.

NORTH-WESTERN TUBERCULOSIS SOCIETY
5 P.M. (Manchester Royal Infirmary.) Dr. E. H. W. Deane: Some Problems of Primary Infection. (Presidential address.)

NUFFIELD ORTHOPÆDIC CENTRE, Wingfield-Morris Hospital, Oxford
8.30 P.M. Prof. W. Mercer: Paget's Disease of Bone.

OSLER CLUB OF LONDON
8 P.M. (Westminster Medical School, Horseferry Road, S.W.1.) Dr. W. R. Bett, Mr. Norman S. Punt, Sir Adolphe Abrahams: Can and Should Public Speaking be Taught to Medical Students? (Joint meeting with the Westminster Medical School Guthrie Society.)

UNIVERSITY OF ST. ANDREWS, Medical School, Dundee
5 P.M. Prof. E. G. T. Liddell, F.R.S.: Control of Muscle.

Friday, 15th

POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Mr. L. N. Pyrah: Uses of the Ileum in Genito-urinary Surgery.
4 P.M. Dr. A. F. Foster-Carter: Applied Anatomy of the Bronchi.

ROYAL SOCIETY OF MEDICINE
4.30 P.M. *Epidemiology and Preventive Medicine.* Dr. R. E. O. Williams, Dr. O. M. Lidwell, Dr. D. D. Reid: Aspects of Airborne Infection.
8.15 P.M. *Radiology.* Dr. J. F. Bromley: Reflections on Radiation Hazards in Clinical Practice. (Presidential address.)

FACULTY OF RADIOLOGISTS
5 P.M. (Royal College of Surgeons.) Sir Harold Boldero: Medical Education, with particular reference to Radiotherapy. Dr. Phyllis Wade: Teaching of Radiotherapy to Undergraduates. Dr. Ralston Paterson: Teaching of Radiotherapy to Postgraduates.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. J. E. M. Wigley: Eczema.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330–332, Gray's Inn Road, W.C.1
4.30 P.M. Mr. R. H. Franklin: Some Advances in the Surgery of the Œsophagus.

BIOCHEMICAL SOCIETY
2.30 P.M. (National Institute for Medical Research, The Ridgeway, Mill Hill, N.W.7.) Scientific Papers.

Saturday, 16th

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2.30 P.M. Scientific Papers.

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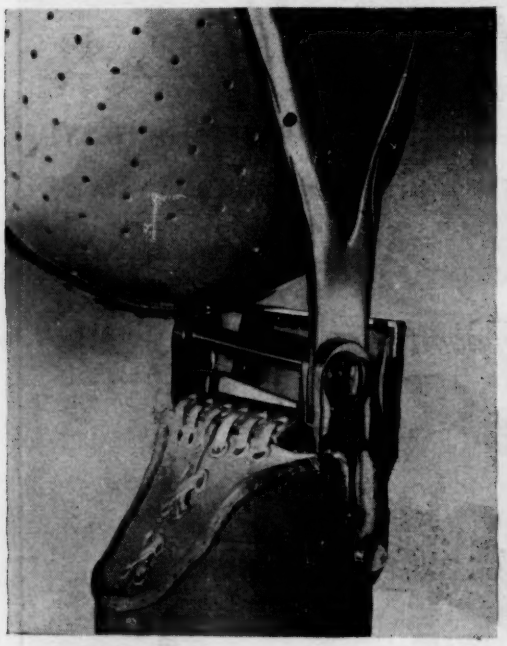

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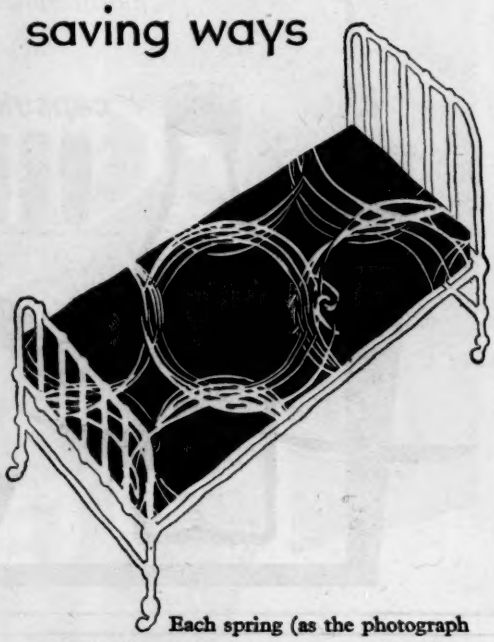

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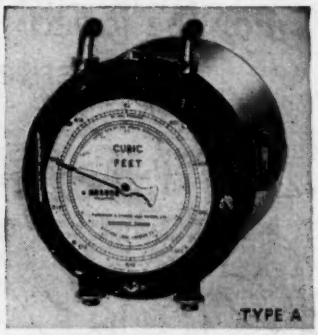

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Academic and Educational

INSTITUTE OF ORTHOPÆDICS
ROYAL NATIONAL ORTHOPÆDIC HOSPITAL,
234, Great Portland-street, W.1
(UNIVERSITY OF LONDON)

COURSE ON DISORDERS OF JOINTS
15TH–20TH NOVEMBER
Provisional Programme Below

Fractures into joints (L)	Mr. P. H. NEWMAN
Manipulation of joints (D)	Mr. H. J. BURROWS
Arthrodesis/Arthroplasty (L/D)	Mr. K. I. NISSEN
Internal Derangement of knee (LD)	Mr. R. Y. PATON
Ankylosing Spondylitis (LD)	Prof. B. W. WINDEYER
Rheumatoid arthritis (LD)	Dr. R. NASSIM
C.D.H. (D)	Mr. D. TREVOR
Dislocations (L)	Mr. H. J. BURROWS
Tuberculosis of spine (D)	Mr. H. J. SEDDON
Tuberculosis of hip and knee (D)	Mr. J. A. CHOLMELEY
The Pathology of Joint Diseases (LD)	Dr. H. A. SISSONS
Hallux valgus and rigidus (LD)	Mr. G. L. W. BONNEY
Loose bodies in joints (L)	Mr. A. W. L. KESSEL
Septic arthritis	Mr. K. I. NISSEN
Chemistry of synovial fluid (LD)	*Dr. P. G. WALKER*
Ætiology and treatment of contractures (LD)	Mr. J. I. P. JAMES Mr. R. L. G. DAWSON
Bacteriology of joint disease (LD)	Dr. C. H. LACK
General Management of joint tuberculosis (LD)	Dr. F. H. STEVENSON
Spondylolisthesis (LD)	Mr. P. H. NEWMAN
Intervertebral disc lesions (LD)	Mr. V. LOGUE

The fee for this course (including lunch and tea) is 7 guineas.
Early application should be made to the Dean at 234, Great Portland-street, W.1.

THE ROYAL SOCIETY

SCIENTIFIC PUBLICATIONS GRANTS

Applications for grants from the second allotment of the Government Grant for Scientific Publications for the year 1954 should be made as soon as possible. No application can be considered which is received later than 15TH NOVEMBER, 1954. This grant is provided for the assistance of scientific publications in the United Kingdom, particularly but not exclusively those of scientific societies and institutions of a national character. A small part of the grant is available for the assistance of the libraries of scientific societies. Applications are receivable only from societies and institutions in the United Kingdom and individuals of British nationality.

Applications will be considered at the same time for grants from funds made available by the Wellcome Trust for the support of publications dealing with research in the field of medical and allied sciences.

Forms of application may be obtained from the Assistant Secretary, The Royal Society, Burlington House, London, W.1.

L.M.S.S.A.

FINAL EXAMINATION: SURGERY, 8th November, 6th December, 1954, 10th January, 1955. MEDICINE, PATHOLOGY, 15th November, 13th December, 1954, 17th January, 1955. MIDWIFERY, 16th November, 14th December, 1954, 18th January, 1955. MASTERY OF MIDWIFERY, May and November. DIPLOMA IN INDUSTRIAL HEALTH, July and December.

For regulations apply REGISTRAR, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

GLASGOW ROYAL INFIRMARY. McGhie Cancer RESEARCH SCHOLARSHIP. Applications are invited from suitably qualified persons (not necessarily medical graduates) for the above Scholarship which is now vacant. This appointment is a whole-time research appointment, and remuneration is at the rate of £800–£1000 p.a., according to age and experience.

Applications, with names of not more than 3 referees, should be forwarded to the undersigned from whom further particulars may be obtained. In their applications, candidates must indicate the nature and scope of their proposed research.

THOMAS BRYSON, M.B., CH.B., Medical Superintendent.
Royal Infirmary, 84, Castle-street, Glasgow, C.4.

MEDICAL RESEARCH COUNCIL. Non-specific urethritis investigation. MICROBIOLOGIST required at Lister Institute, Chelsea Bridge-road, London, S.W.1, for research on ætiology of non-specific urethritis. Funds available for 1 years research, and probably they will be made available for a total of 3 years. Viruses, pleuro-pneumonia-like organisms, bacteria, and protozoa will have to be considered during course of investigation, and successful applicant will have benefit of working closely with other Microbiologists and Biochemists at the Institute. Clinical investigations are now being made at St. Mary's Hospital and the London Hospital. Initial salary will be not more than £1800 p.a.; superannuation provided.

Candidates, who should preferably, though not necessarily, possess medical qualifications and have some experience of clinical bacteriology and virus work, should write (full details) to—
Prof. A. A. MILES, Director of the Institute.

UNIVERSITY OF DURHAM MEDICAL SCHOOL, King's COLLEGE, AND ROYAL VICTORIA INFIRMARY, NEWCASTLE UPON TYNE. FIRST ASSISTANT in the Professorial Surgical Unit. Applications are invited for the post of First Assistant in the Professorial Unit in the Department of Surgery. The appointment is for 1 year in the first instance, renewable to a maximum of not more than 3 years. The salary is within the range £1200–£1700 a year, according to qualifications and experience and is superannuable. The appointment is whole-time and the duties are divided between the Clinical Unit in the Royal Victoria Infirmary and the Department of Surgery in the Medical School.

Further particulars may be obtained from the undersigned to whom applications together with the names of 3 referees should be sent not later than 31st October, 1954.

G. R. HANSON, Registrar of King's College.

UNIVERSITY OF MALAYA, Singapore. Applications are invited for a LECTURESHIP IN PATHOLOGY. Salary scale £1295–£49–£1442/£1540–£56–£1988 p.a., point of entry according to qualifications and experience. Allowances: expatriation in range £280–£308 p.a., cost-of-living in range £210–£560 p.a. All paid in Malayan currency. Free passages for appointee, wife, and children under 12 years. Part-furnished quarters at reasonable rent. Provident fund scheme.

Applications (6 copies), naming 3 referees, and detailing qualifications and experience, to be received by 31st October by Secretary, Inter-University Council for Higher Education in the Colonies, 1, Gordon-square, London, W.C.1, from whom further particulars may be obtained.

ST. MARY'S HOSPITAL MEDICAL SCHOOL (University OF LONDON), Paddington, W.2. Applications are invited from those with a medical qualification for the appointment of JUNIOR LECTURER IN CHEMICAL PATHOLOGY. Salary within the scale £900–£100–£1100, together with superannuation under the F.S.S.U. and children's allowance.

Applications (2 copies), together with the names of 3 referees, should be sent before 29th October to the Secretary, from whom further particulars may be obtained.

WORLD HEALTH ORGANIZATION invites applications for the post of REGIONAL MATERNAL AND CHILD HEALTH ADVISER for the Eastern Mediterranean area (Regional Office in Alexandria). The person appointed will be required, under the direction of the W.H.O. Regional Director, to advise governments in the organisation and promotion of maternal and child health services and the training of personnel; to assist in the development of field projects; and to supervise technical personnel working in the Region. Considerable time will be spent in travel within the Region. Candidates should have a recognised state qualification in medicine, preferably with a diploma and experience in general public health. Postgraduate training and experience in pædiatrics and/or obstetrics, and in the administration of maternal and child health services is essential. Candidates should have excellent knowledge of English and fluency in French is highly desirable. The salary offered is $7300 p.a., free of tax.

Applications, making reference to this advertisement, should be sent immediately to: Personnel Section, World Health Organization, Palais des Nations, Geneva.

Hospital Services: Senior Appointments

NATIONAL HOSPITALS FOR NERVOUS DISEASES. The Board of Governors invites applications for the appointment of OPHTHALMIC SURGEON (Consultant status) at The National Hospital, Queen-square, W.C.1. Applicants should hold a higher Degree or Diploma in Ophthalmology. The appointment will be part-time and the successful applicant will be required to attend 1 half-day per week.

Applications (35 copies), giving the names of 3 referees, must be sent to the undersigned not later than 30th October.

H. EWART MITCHELL, Secretary.
The National Hospitals for Nervous Diseases,
Queen-square, W.C.1.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited to fill a vacancy for a Whole-time ASSISTANT PATHOLOGIST to the Greenwich and Deptford Group of hospitals. Candidates must have had general experience in pathology and possession of a higher qualification is desirable. Salary within the scale £1500–£50–£1950.

Apply, stating nationality, age, sex, qualifications, and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 23rd October, 1954.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

Full-time CONSULTANT PATHOLOGIST, Haymeads Hospital, Bishop's Stortford, Herts. To act as Area Pathologist of Hertford Group. Residence in the area is a condition of the appointment.

Full-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade), Warley Hospital, Brentwood, Essex. Resident post. Modern unfurnished house available.

Full-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade), South Ockendon Group of hospitals, Essex. Applicants should be holders of D.P.M. with experience in mental deficiency. Duties throughout Group as required, but mainly at South Ockendon Hospital within reasonable distance of which successful candidate will be required to reside. No single or married accommodation available.

Applications (6 copies), and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 23rd October.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) SENIOR CASUALTY OFFICER (whole-time) at Watford Peace Memorial Hospital, Watford (196 Beds), to organise the work of a busy Casualty Department and to act as Admissions Officer, subject to the general supervision of the Senior Surgeon of the department. A higher qualification in surgery is desirable. Duration of tenure of post not exceeding 4 years. Salary scale £1500 (unless below age 32)–£1950. Successful candidate must reside near the hospital.

Applications by 18th November, 1954.

(2) ASSISTANT PHYSICIAN in Physical Medicine (whole-time), Edgware General Hospital, Edgware, Middlesex (651 Beds). Salary scale £1500 (unless below age 32)–£1950.

Applications by 16th November, 1954.

Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

EPSOM, SURREY. LONG GROVE HOSPITAL (for mental and nervous disorders). Locum Tenens SENIOR HOSPITAL MEDICAL OFFICER required from 17th October, 1954, for approximately 3 months. Candidates must have a wide experience of psychiatry. Salary 31½ guineas per week. *Residential accommodation* for a single man or woman available at an appropriate charge.

Applications to the Physician-Superintendent as soon as possible.

LIVERPOOL REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of MEDICAL SUPERINTENDENT (Consultant) of Greaves Hall (Mental Deficiency Hospital), *Banks, near Southport. Applicants should have had* special experience in mental deficiency, but Psychiatrists with adequate training who are prepared to specialise in this branch will be considered. Duties will include outpatient work and Consultative advice to Local Authorities. *Greaves Hall, with an* existing bed complement of 100 beds, is now in process of extension and will ultimately comprise a comprehensive colony of *1000 beds, embodying modern principles* in design, layout, and construction. For the present, in addition to his clinical and administrative duties at Greaves Hall, the person appointed will be required to undertake consultant duties at 4 other small mental deficiency hospitals in the Region. *Residential married* accommodation is at present available in Greaves Hall, and a house is to be provided as part of the extension scheme.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 30th October, 1954.

VINCENT COLLINGE, *Secretary to the Board.*

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) Additional part-time (9 half-days) post of CONSULTANT *PLASTIC SURGEON with main duties at Wythenshawe* Hospital (the regional plastic centre) and also at Withington, the Duchess of York (Babies) and the Christie Hospitals, all in *Manchester,* and with occasional duties at Booth Hall Children's Hospital Burns Unit and other peripheral centres. Successful applicant to live in or near Manchester. 25th October, 1954.

(*b*) Whole-time RESIDENT ASSISTANT PSYCHIATRIST at *Lancaster Moor Hospital, near Lancaster (about 2500 Beds).* Married or single accommodation available. Candidates should have had considerable experience in psychiatry. Salary £1500–£50–£1950 p.a. 18th October, 1954.

(*c*) Whole-time NON-RESIDENT ASSISTANT *RADIOLOGIST* (Senior Hospital Medical Officer) to the North Manchester Hospitals (Ancoats, Manchester Victoria Memorial Jewish, *Manchester Northern, and Crumpsall Hospitals*) and at Booth Hall Children's and Monsall Hospitals. Successful candidate will work under general guidance of Consultants in wide range of *radiological investigations,* including specialised paediatrics, neurosurgical and cardiological. Candidates should have wide experience of diagnostic radiology. D.M.R.D. essential. 20th October, 1954.

(*d*) *2 whole-time resident posts of* CONSULTANT PSYCHIATRIST AND DEPUTY MEDICAL SUPERINTENDENT to :—

(i) Whittingham Hospital, near Preston (about 3000 Beds).
(ii) Lancaster Moor Hospital, near Lancaster (about 2500 Beds).

All modern forms of treatment undertaken. Wide experience in psychiatry essential. *Very good residential* accommodation available. Further inquiries to be of respective Medical Superintendents. 26th October, 1954.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by dates stated.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Whole-time ASSISTANT TUBERCULOSIS PHYSICIAN to the Lanarkshire Area. Salary (at age 32 and over) on the scale £1500–£50–£1950. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western *Regional Hospital Board,* 64, West Regent-street, Glasgow, not later than 30 days after the publication of this advertisement.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Whole-time ASSISTANT RADIOLOGIST based at Kilmarnock *Infirmary, with duties in Ayrshire Area.* Salary (at age 32 and over) on the scale £1500–£50–£1950. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), *stating date of birth, qualifications,* experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, not later than 30 days after the publication of this advertisement.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Part-time CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST for 9 notional half-days a week in the Bromley, Kent, Group of hospitals. Candidates must have had wide experience in obstetrics and gynæcology and be Members of the Royal College of Obstetricians and Gynecologists. The possession of other higher qualifications is desirable. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales). Candidates may visit the hospitals concerned.

Apply, stating nationality, age, qualifications, and experience, *including details of present appointment* and war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 23rd *October, 1954.*

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT CHEST PHYSICIAN for the Grimsby Area. *Duties will include attendance at Clinics in Grimsby and Louth,* and the care of patients in the Springfield Hospital where there is a Thoracic Surgical Unit (104 chest diseases beds and 24 chest surgery beds). The successful candidate will work under the direction of the *Consultant Chest Physician for the area.* Candidates should have good general medical experience and special experience in the treatment of chest diseases and tuberculosis. Salary scale £1500–£50–£1950.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10. Forms to be returned by *30th October, 1954.*

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST required for *Carlton Hayes Hospital,* Narborough, near Leicester. House available. Salary £1500–£50–£1750.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. *Forms to be returned by 30th October,* 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Con*SULTANT ORTHOPÆDIC SURGEON* required for 8 notional half-days per week. Main Centre Grimsby, with other duties at Scunthorpe or Louth.

Further details and application forms from Senior Administrative Medical Officer, Sheffield *Regional Hospital Board, Fulwood* House, Old Fulwood-road, Sheffield, 10. To arrive not later than 6th November, 1954.

WELSH REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer), St. David's Hospital, Carmarthen (950 Beds). All modern methods of treatment, active outpatient clinics. House available.

Applications (12 copies) to Senior Administrative Medical Officer), Temple of Peace, Cathays Park, Cardiff, within 21 days *of appearance of this advertisement.*

WELSH REGIONAL HOSPITAL BOARD. Deputy MEDICAL SUPERINTENDENT (Senior Hospital Medical *Officer), Llangwyfan* Hospital, near Denbigh. House available. 370 Beds, pulmonary, non-pulmonary tuberculosis and thoracic surgery for men, women and children.

Applications (12 copies), naming 3 referees, to Senior Administrative *Medical Officer, Temple of Peace, Cathays Park,* Cardiff, within 21 days.

WOLVERHAMPTON. ROYAL HOSPITAL. Whole-*time SENIOR CASUALTY OFFICER* to have clinical charge of Casualty Department. Salary £1500–£1950 p.a. Tenable up to 4 years. Higher qualification an advantage.

Applications (15 copies), stating name, age, nationality, qualifications, present and *previous appointments, and details* of 3 referees, to Secretary, Birmingham Regional Hospital Board, 10, Augustus-road, Birmingham, 15, before 25th *October, 1954.*

WORCESTER. POWICK HOSPITAL. (1043 Beds.) Locum Tenens Whole-time CONSULTANT PSYCHIATRIST required *immediately* for 3 months. Salary 45 guineas per week if of Consultant grading, otherwise 31½ guineas.

Applications, naming 2 referees, to Secretary, Birmingham Regional Hospital Board, 10, Augustus-road, Birmingham, 15, before 25th October, 1954. *Candidates may visit Hospital.*

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a post as CONSULTANT PHYSI*CIAN at hospitals managed by the Banbridge and Dromore* and South Armagh Hospital Management Committees. The terms and conditions will be in accordance with the application of the Spens report to Northern Ireland.

Applications to be made on a form *obtainable (with further* particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be received not *later than 6th November, 1954.*

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a whole-time post as CONSULTANT PSYCHIATRIST for duties at the Child Guidance Clinic, Royal Belfast Hospital for Sick Children. The terms and conditions will be in accordance with the Authority's application of the Spens report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be received not *later than 6th November, 1954.*

CANADA. REGINA GENERAL HOSPITAL, Regina, SASKATCHEWAN. Applications are invited for a RADIOLOGIST (800-Bed General Hospital). General Radiographic Service, mostly diagnostic. Remuneration and *conditions of service* to be arranged. Minimum starting salary $8000.

Applications to be forwarded to Superintendent, Regina *General Hospital, Regina, Saskatchewan.*

CANADA. REGINA GENERAL HOSPITAL, Regina, SASKATCHEWAN. Applications are invited for a CLINICAL PATHOLOGIST (800-Bed General Hospital). General Pathology Department with a *Director, and an Assistant* Pathologist already on staff. Emphasis to be placed on hæmatology and bacteriology. Salary and conditions of employment by agreement. *Minimum starting salary* $6000.

Applications to be forwarded to Superintendent, Regina General Hospital, Regina, Saskatchewan.

Hospital Services : Junior Appointments

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of REGISTRAR to the Skin Department. A higher qualification, *although desirable, is not essential.*

Applications (12 copies), together with the names and addresses of 3 referees, should reach the House Governor by 1st November, *1954.* H. BRIERLEY, House Governor.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, N.21. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required at above Hospital for Tuberculosis Unit of 100 Beds. Experience in chest diseases essential. Resident or non-resident. If non-resident required to sleep in on nights on duty. Hospital may be visited by prior appointment.

Application forms obtainable from, and returnable to, Secretary, Northern Group Hospital Management Committee Royal Northern Hospital, Holloway, N.7, by 19th October.

LEWISHAM GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for 2 appointments of JUNIOR HOSPITAL MEDICAL OFFICER in Chest Diseases for duties at Grove Park Hospital, Lee, S.E.12, and from time to time at *Lewisham Chest Clinic. Resident or non-resident posts,* tenable for 3 years in the first instance.

Applications, stating age, qualifications and experience, with relevant dates, together with names and addresses of 3 referees, to be sent to the Secretary, Group Offices, Lewisham Hospital, London, S.E.13, not later than 20th October, 1954.

LONDON CHEST HOSPITAL. Hospitals for Diseases of the Chest. 2 vacancies occur 1st December, 1954, for RESIDENT HOUSE PHYSICIAN. Appointments for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and *posts are graded as House Officer. Duties include work in the* Outpatient Department and Refill Clinic as well as in wards.

Applications, stating age, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 23rd October.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. (130 Beds.) HOUSE SURGEON (pre-registration or first, second, or third) required for 6 months commencing 5th November, 1954.

Applications, with copies of testimonials, to be sent to the Hospital Secretary.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. *SENIOR HOUSE OFFICER (resident) in Surgery, required for* 22nd November. Appointment for 6 months in the first instance. General surgery, trauma, and orthopædics. Post recognised *for F.R.C.S.*

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials or names of 2 referees, to Secretary of Hospital, by 19th October.

MILE END HOSPITAL, Bancroft-road, E.1. (475 Beds.) HOUSE PHYSICIAN (pre-registration or first, second, or third) required for 6 months commencing 18th November, 1954.

Application forms obtainable from Physician-Superintendent, to be returned by 23rd October with copies of not more than 3 testimonials.

MIDDLESEX HOSPITAL, W.1. Applications invited for post of SENIOR NEUROLOGICAL REGISTRAR, vacant 1st January.

Rules and application forms obtainable from Deputy Superintendent, *to whom applications, naming 2 referees, should* be sent by 30th October.

MIDDLESEX HOSPITAL, W.1. Applications invited for *post of SENIOR NEUROSURGICAL REGISTRAR, vacant* 1st January. Candidates must hold a higher surgical qualification and have had experience in neurosurgery.

Rules and application forms obtainable from Deputy Superintendent, to whom applications, naming 2 referees, should be sent by 30th October.

MIDDLESEX HOSPITAL, W.1. Applications invited for posts of *SENIOR REGISTRAR and of REGISTRAR* in Obstetrics and Gynæcology, vacant 1st January. Duties at the Middlesex Hospital and the Hospital for Women, Soho.

Rules and application forms obtainable from Deputy Superintendent, to whom applications, naming 2 referees, should be sent by 30th October.

MIDDLESEX HOSPITAL, W.1. Applications invited for posts of SENIOR SURGICAL REGISTRAR and of SURGICAL REGISTRAR, vacant 1st January.

Rules and application forms obtainable from Deputy Superintendent, *to whom applications, naming 2 referees, should be* sent by 30th October.

MIDDLESEX HOSPITAL, W.1. Applications invited for *2 posts of REGISTRAR* in Physical Medicine, vacant 1st January.

Rules and application forms obtainable from Deputy Superintendent, to whom applications, naming 2 referees, should be *sent by 30th October.*

MIDDLESEX HOSPITAL, W.1. Applications invited for post of CASUALTY MEDICAL REGISTRAR, vacant 1st January.

Rules and application forms obtainable from Deputy Superintendent, to whom applications, naming 2 referees, should be sent by 30th October.

MIDDLESEX HOSPITAL, W.1. Applications invited for posts of SENIOR REGISTRAR and of REGISTRAR in Anæsthetics, vacant 1st January.

Rules and application forms obtainable from Deputy Superintendent, to whom applications, naming 2 referees, should be sent by 30th October.

MIDDLESEX HOSPITAL, W.1. Applications invited for post of TRANSFUSION OFFICER AND RESEARCH ASSISTANT to the Director of Surgical Studies (graded as Registrar) vacant 1st January.

Rules and application forms obtainable from Deputy Superintendent, to whom applications, naming 2 referees, should be sent by 30th October.

MIDDLESEX HOSPITAL, W.1. Applications invited for post of REGISTRAR in the Department of Radiotherapy.

Forms of application obtainable from the Deputy Superintendent should be submitted, naming 2 referees, by 20th October.

MIDDLESEX HOSPITAL, W.1. Applications invited for 4 posts of MEDICAL REGISTRAR, vacant 1st January.

Rules and application forms obtainable from Deputy Superintendent, to whom applications, naming 2 referees, should be sent by 30th October.

NATIONAL HEART HOSPITAL, Westmoreland-street, W.1. (With which is associated The Institute of Cardiology.) The Board of Governors invites applications to fill a vacancy in the post of SENIOR REGISTRAR as from 1st January, 1955. Applicants should have been fully trained in general medicine and should possess a higher medical qualification. Opportunities for research are available.

Applications, with copies of 3 recent testimonials, should be *sent to me not later than Saturday, 23rd October, 1954.*

ROBERT G. E. WHINEY, Secretary to the Board.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited for the post of RESIDENT MEDICAL OFFICER (or if the present House Physician is appointed to this post there will be a vacancy for House Physician) at Maida Vale Hospital for Nervous Diseases, London, W.9. Appointment in the first instance for *6 months from the 1st November.* Grading as Senior House Officer or Registrar according to experience. Preference will be given to a candidate holding a higher degree and previous neurological experience will be an asset.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, at Maida Vale Hospital, not later than *13th October, 1954.*

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners *for the appointment of HOUSE SURGEON at The National* Hospital, Queen-square, W.C.1, commencing 1st February, 1955. This post carries the grade of Registrar.

Applications, giving the names of 3 referees, to be sent to *the undersigned not later than 30th October, 1954.*

H. EWART MITCHELL,
Secretary to the Board of Governors.
The National Hospitals for Nervous Diseases,
Queen-square, W.C.1.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE, Hackney-road, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. HOUSE OFFICERS (2). These appointments will be made for 2 consecutive periods of 6 months commencing 1st December, 1954. First appointment as House *Physician and second as House Surgeon and Casualty Officer in* each case.

Application forms may be obtained from the Secretary at Hackney-road, and should be returned with copies of not more *than 3 testimonials on or before 18th October, 1954.*

ROYAL FREE HOSPITAL. Applications are invited for the appointment of SENIOR REGISTRAR to the Orthopædic Department. Applicants must be registered medical practitioners and Fellows of the Royal College of Surgeons. The appointment is recognised under the Senior Registrar establishment and is *for 1 year in the first instance. Duties to commence on 1st* January, 1955.

Applications, together with the names of 3 referees, should be sent to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, *not later than 22nd October,* 1954.

ROYAL FREE HOSPITAL. Applications are invited for *the post of SENIOR SURGICAL REGISTRAR at the above* Hospital. Candidates should be registered medical practitioners and Fellows of the Royal College of Surgeons. The appointment is recognised under the Senior Registrar establishment and is for 1 year in the first instance. Duties to commence on 1st January, 1955.

Applications, together with the names of 3 referees, should *be sent to the Secretary to the Board of Governors, Royal Free* Hospital, Gray's Inn-road, W.C.1, not later than 22nd October, 1954.

ROYAL FREE HOSPITAL. *Applications are invited from* registered Men and Women medical practitioners for the appointment of RESIDENT ASSISTANT PATHOLOGIST at the above Hospital. Salary in accordance with Ministry of Health scale for House Officers. The appointment is for 6 months in the first instance, subject to possible reappointment for a further 6 months. Duties to commence on 1st January, 1955.

Application forms may be obtained from the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 29th October, 1954.

ROYAL MASONIC HOSPITAL, Ravenscourt Park, W.6. The post of RESIDENT SURGICAL REGISTRAR will become vacant about 15th November, 1954. Gross salary £850 (residential emoluments of £130 deductable).

Applications should state age, qualifications, past and present appointments, include 2 recent testimonials, and the names of 2 referees, and should reach the Hospital as soon as possible, but not later than first post on 21st October, addressed to the Secretary and House Governor, from whom further information would be given on request.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. Applications are invited for the post of HOUSE PHYSICIAN vacant 18th November, 1954. Preference given to pre-registration candidates.

Applications to be sent to the Hospital Secretary by 20th October, 1954.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, London, W.1. *Applications are invited* for the appointment of RESIDENT SENIOR HOUSE OFFICER for a period of 6 months; duties to commence 28th December, 1954.

Applications to be received not later than 29th October, 1954. Forms of application can be obtained from the House Governor at 234, Great Portland-street, London, W.1.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, Stanmore, Middlesex. Applications are invited for the post of *Whole-time REGISTRAR in Anæsthetics (non-resident). Duties* to commence 1st January, 1955.

Applications, with names of 3 referees, to be addressed to the House Governor, 234, Great Portland-street, London, W.1, by 29th October, 1954.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, London, W.1. Applications are *invited for the appointment of ORTHOPÆDIC REGISTRAR* (full-time), non-resident. Preference will be given to candidates with a higher surgical qualification.

Applications to be received not later than 22nd October. Forms of application can be obtained from the House Governor, at 234, Great Portland-street, London, W.1.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Orthopædic Surgery to fill a vacancy in the approved trainee establishment at the Lewisham Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 23rd October, 1954.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. *Applications are invited for 2 appointments as* REGISTRAR in Chest Diseases to fill vacancies in the approved trainee establishment at the Lewisham Group of hospitals. Each registrar will work part-time at Grove Park Hospital, Marvels-lane, Lee, S.E.12, where there is a Thoracic Surgery Unit, and part-time at a Chest Clinic or Mass Miniature X-ray Unit, the latter duties being interchanged at intervals. Candidates must have had good experience in general medicine and in the diagnosis and treatment of pulmonary tuberculosis in adults. The appointments will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales) and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 23rd October, 1954.

SOUTH LONDON HOSPITAL FOR WOMEN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Female medical practitioners for the appointment of OBSTETRIC HOUSE SURGEON at the above Hospital. Post recognised for the M.R.C.O.G. Appointment is for 6 months from 3rd December, 1954.

Forms of application from the Secretary.

SOUTH LONDON HOSPITAL FOR WOMEN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Female medical practitioners for the appointment of GYNÆCOLOGICAL HOUSE SURGEON at the above Hospital, vacant in December for 6 months. Recognised for M.R.C.O.G.

Application forms from the Secretary.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics), recognised for D.A., and F.F.A.R.C.S., commencing 1st December, 1954.

Applications, stating age, qualifications, experience, together with the names and addresses of 2 referees, to be forwarded to Hospital Secretary by 30th October.

ST. GEORGE-IN-THE-EAST HOSPITAL, Raine-street, Wapping, E.1. Applications are invited for the post of HOUSE PHYSICIAN (pre- or post-registration). Post vacant 26th October, 1954. Tenable for 6 months. Salary, &c., in accordance with national scale.

Application forms available from, and returnable to, the Medical Superintendent.

ST. MARK'S HOSPITAL, City-road, E.C.1. Applications invited from Senior Registrars who have completed their training, or from Registrars who have completed their appointments, for the post of Whole-time SURGICAL OFFICER (part-resident). Salary at the rate of £1400 or £965 respectively. Appointment tenable 6 months from 1st November or 1st December with possibility extension further 6 months.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, Hammersmith, West London, and St. Mark's Hospitals, Ducane-road, London, W.12, by 16th October.

ST. NICHOLAS HOSPITAL, Plumstead, London, S E.18 CASUALTY OFFICER, vacant 1st November. Recognised for F.R.C.S. 6 months appointment (not pre-registration). Salary £525 p.a., less £125 p.a. for residence. There is also a Senior House Officer in the department.

Apply to Group Secretary. Memorial Hospital, Woolwich, S.E.18.

ST. MARY'S HOSPITAL, W.2. Applications are invited from suitably qualified practitioners for the post of CASUALTY SURGEON (resident). Candidates must have held an appointment as House Surgeon at this Hospital or at another hospital approved by the Board of Governors. The appointment is for a first period of 6 months, with effect from 1st January, 1955; remuneration at Senior House Officer rate.

Applications, stating nationality, date of birth, permanent address, qualifications, with dates and details of present and previous appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 27th October, 1954.

ST. MARY'S HOSPITAL, W.2. Applications are invited from suitably qualified registered practitioners for the post of *RESIDENT ANÆSTHETIST. The appointment is for a first* period of 6 months, and the successful candidate will be required to take up his duties on 3rd January, 1955, at a salary of £525, less £125 p.a. for board and residence provided.

Applications, stating nationality, date of birth, permanent address, qualifications with dates and experience, together with names and addresses of 3 referees, should reach ALAN POWDITCH, *House Governor, by 27th October, 1954.*

ST. MARY'S HOSPITAL, London, W.2 (Ophthalmic DEPARTMENT); WESTERN OPHTHALMIC HOSPITAL, Marylebone-road, N.W.1. Applications are invited for the post of Whole-time *SENIOR REGISTRAR* (non-resident). *Candidates must* have postgraduate experience and should hold, or be studying for, the F.R.C.S. The successful candidate will be expected to take up his duties as soon as possible.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, and details of previous and present appointments and experience, together with the names *and addresses of 3 referees, should reach the undersigned by* 26th October, 1954.

ALAN POWDITCH, Secretary to the Board of Governors.

ST. MARY'S HOSPITAL, Paddington, W.2, and THE NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRARS in General Surgery (2 vacancies) required on 1st January, 1955, for a combined appointment *which will normally be for a period of 4 years—namely,* first and fourth years at St. Mary's Hospital; second and third years at Ashford and Paddington Hospitals. Possession of higher surgical qualifications essential. Hospitals may be visited by direct appointment.

Applications, stating nationality, date of birth, permanent address, qualifications with dates and details of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 27th October, 1954.

ST. MARY'S HOSPITAL, Paddington, W.2, and THE NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in General Medicine required on 1st January, 1955, for a combined appointment which will normally be for a period of 4 years—namely, first and fourth years at St. Mary's Hospital; second and third years at West Middlesex Hospital. Possession of higher medical qualification essential. Hospitals may be visited by direct appointment.

Applications, stating nationality, date of birth, permanent address, qualifications with dates and details of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 27th October, 1954.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. Applications are invited for the post of SURGICAL REGISTRAR (£850/£965 p.a.).

Applications, with names of 2 referees, to the Administrator and Secretary, by 18th October, 1954.

WEST LONDON HOSPITAL, Hammersmith-road, W.6. HOUSE SURGEON (general and gynæcological) required 1st December. Pre-registration candidates considered.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary by 18th October.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP. Applications are invited for the post of HOUSE PHYSICIAN (geriatrics) at above Hospital.

Application forms are obtainable from the Hospital Secretary, and should be returned to him by not later than 20th October, 1954.

WHITTINGTON HOSPITAL, Highgate Hill, N.19. Locum Tenens SENIOR REGISTRAR (obstetrics and gynæcology) required from 5th November for at least 1 month.

Detailed applications, with names of 2 referees, to Medical Superintendent, immediately.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. ABERDEEN ROYAL INFIRMARY. Applications are invited for the appointment of REGISTRAR in Orthopædics at the above Hospital. The post is a whole-time one and is non-resident. Salary and conditions of service in accordance with the terms issued by the Department of Health for Scotland.

Applications, giving details of qualifications, and experience, with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Shrewsbury Group Hospital Management Committee, Royal Salop Infirmary, Shrewsbury**

Whole-time REGISTRAR in Obstetrics and Gynæcology. Duties at Royal Salop Infirmary and Copthorne Hospital. Hospital recognised for M.R.C.O.G. (Gynæcology). Duties include teaching, supervision of Consultant trainees and considerable clinical responsibility.

(2) **South Warwickshire Hospital Group, 50, Hollywalk, Leamington Spa**

Whole-time REGISTRAR in General Surgery. Duties mainly at Warwick Hospital (350 Beds). Experience general surgery desirable.

(3) **West Bromwich and District Hospital Management Committee, West Bromwich and District General Hospital, Edward-street, West Bromwich**

Whole-time REGISTRAR in Anæsthetics. Duties at Midland Centre for Neurosurgery, Smethwick Hospital, and other Group hospitals. Experience specialty required.

(4) **Birmingham (Selly Oak) Hospital Management Committee, Oak Tree-lane, Birmingham, 29**

REGISTRAR in General Surgery. Duties at Little Bromwich Hospital and Solihull Hospital. Higher qualification desirable. Resident at Little Bromwich Hospital.

Application forms from Group Secretaries, to be returned before 25th October, 1954. Candidates may visit hospitals.

BIRMINGHAM (SANATORIA) GROUP HOSPITAL MANAGEMENT COMMITTEE. YARDLEY GREEN HOSPITAL. THORACIC SURGICAL UNIT. *Applications are invited for the post of* SENIOR HOUSE OFFICER or HOUSE OFFICER according to experience. The appointment will give broad opportunities for experience in both tuberculous and non-tuberculous thoracic surgery.

Applications, stating age, qualifications, training and experience, together with copies of 3 recent testimonials, should be addressed to the Secretary, Yardley Green Hospital, Birmingham, 9.

BIRMINGHAM (SELLY OAK) GROUP 25 HOSPITAL MANAGEMENT COMMITTEE. Vacancy occurs for a SENIOR HOUSE OFFICER in Pathology in the main laboratory of this Group situated at Selly Oak Hospital. The post is a residential one and experience in hæmatology is an advantage but not essential. Salary in accordance with regulations.

Applications to the Pathologist, Selly Oak Hospital, Birmingham, 29.

BIRMINGHAM. ST. MARGARET'S HOSPITAL, Great BARR PARK, BIRMINGHAM, 22A. Locum Tenens REGISTRAR required immediately (either sex). Salary £16 per week. Residential accommodation available.

Applications, stating names of 2 referees, to Medical Superintendent.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. *Applications are invited from registered medical practitioners for the following appointments vacant on 7th January, 1955 :—*

(*a*) 2 RESIDENT GYNÆCOLOGICAL HOUSE SURGEONS *for duty at Women's Hospital, Sparkhill.*

(*b*) 1 RESIDENT OBSTETRICAL HOUSE SURGEON for duty at The Maternity Hospital, Loveday-street.

The posts are recognised for D.Obst.R.C.O.G. and M.R.C.O.G.

Application forms obtainable from the House Governor, The Birmingham and Midland Hospitals for Women, Showell Green-lane, Birmingham, 11, to be returned not later than 1st November, 1954. G. A. PHALP, Secretary.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (790 Beds.) HOUSE SURGEON (resident) required, recognised for pre-registration and F.R.C.S. (Eng.). Vacant 1st November, 1954, in General Surgery Unit of approximately 80 adult and 10 children's beds under control of 2 Consultant Surgeons.

Detailed applications, with copies of 3 recent testimonials, to Secretary.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. BURY GENERAL HOSPITAL. SENIOR HOUSE OFFICER (*medical*) at the above Hospital.

Applications, giving names of 2 referees, should be made to H. WILKINSON, Esq., Group Secretary.

Bury General Hospital, Bury, Lancs.

BEDFORD GENERAL HOSPITAL. (437 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required for busy acute Orthopædic and Traumatic Department at above Hospital. Previous orthopædic experience desirable. Candidates may visit Hospital by appointment with the Group Secretary.

Application forms obtainable from, and returnable to, Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, as soon as possible.

BISHOP'S STORTFORD AND DISTRICT HOSPITAL, Rye-street, BISHOP'S STORTFORD, HERTS. (67 Beds—medical, surgical and maternity. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for a RESIDENT HOUSE OFFICER (not pre-registration). Appointment to commence as soon as possible.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials or names of referees, should be sent to Hospital Secretary, Haymeads Hospital, Bishop's Stortford, Herts.

BLACKBURN AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics) required for duties throughout Group, mainly at Blackburn Royal Infirmary. Residence at Queen's Park Hospital, Blackburn. Post recognised for D.A. and F.F.A.R.C.S.

Apply to Secretary of Committee, with names of 2 referees or copies of testimonials, Royal Infirmary, Blackburn.

BLACKBURN (near). CALDERSTONES HOSPITAL, WHALLEY, near BLACKBURN, LANCS. (For Mental Defectives—2300 Beds.) CALDERSTONES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER. Salary scale £775–£50–£1075. Health Service conditions of service and superannuation scheme. Unfurnished house available for rent to married man; residential quarters available for single man.

Applications, stating age, qualifications and experience, together with the names and addresses of 3 referees, to be submitted to the Medical Superintendent, Calderstones Hospital, Whalley, near Blackburn, as soon as possible.

BLACKPOOL. VICTORIA HOSPITAL. (344 Beds.) SENIOR HOUSE OFFICER (E.N.T. Department). Post vacant 1st December, 1954. Recognised for the F.R.C.S. and D.L.O.

Applications, with names and addresses of referees, to the Hospital Secretary.

BLACKPOOL. VICTORIA HOSPITAL. (344 Beds.) RESIDENT HOUSE OFFICER (gynæcology and obstetrics). Recognised for M.R.C.O.G. Post vacant 1st November, 1954. This is a busy general hospital with a large Outpatient Department and the post offers excellent opportunities for experience under Consultant Gynæcologists and Obstetricians.

Applications, with names and addresses of referees, to the Hospital Secretary.

BOLTON DISTRICT GENERAL HOSPITAL. (604 Beds.) BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER in Medicine, vacant end October, tenable for 12 months.

Applications, with the names of 2 referees, to Group Secretary, The Royal Infirmary, Bolton.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

Group Laboratories

RESIDENT PATHOLOGIST (Senior House Officer grade), vacant 16th October, tenable for 12 months and recognised for the Dip. Path.

The Royal Infirmary, Bolton (237 Beds)

SENIOR HOUSE OFFICER in Ophthalmology, now vacant, tenable for 12 months.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to Group Secretary, The Royal Infirmary, Bolton.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. ROYAL VICTORIA HOSPITAL, WEST-BOURNE, HANTS. Applications are invited for the appointment of HOUSE SURGEON for E.N.T. and ophthalmic duties, vacant immediately. In addition to duties at the above Hospital, the successful candidate will be required to assist in the E.N.T. outpatient clinics at the Royal Victoria Hospital, Bournemouth, and Poole General Hospital. The appointment is recognised for the D.O. and D.L.O. Diplomas but not for pre-registration purposes.

Applications to the Deputy Hospital Secretary, Royal Victoria Hospital, Shelley-road, Bournemouth.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (492 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (resident), orthopædic and casualty combined. *The post, which is recognised* for the F.R.C.S. examination, becomes vacant on 27th October and is tenable for 12 months.

Applications to the Deputy Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOSCOMBE. (492 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of 2 HOUSE PHYSICIANS, both posts vacant on 4th November and are recognised for pre-registration purposes.

Applications to the Deputy Hospital Secretary.

BRADFORD. ST. LUKE'S HOSPITAL. House Officer (paediatrics), vacant 1st November, 1954. Recognised for pre-registration purposes. Salary £425–£525 p.a., less £125 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience with copy testimonials to Secretary, Bradford Royal Infirmary.

BRADFORD. ROYAL EYE AND EAR HOSPITAL. HOUSE SURGEON (ophthalmology), vacant 22nd November, 1954. Recognised for D.O.M.S. and F.R.C.S. Salary according to Whitley Council (MDB) rates.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD ROYAL INFIRMARY. House Officer (orthopædic/casualty). 2 posts vacant 26th October, 1954. Salary £425–£525 p.a., less £125 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRISTOL EYE HOSPITAL. United Bristol Hospitals. (Joint appointment with the South-Western Regional Hospital Board.) Applications are invited by the above Boards from registered medical practitioners for the appointment of REGISTRAR in Ophthalmology. The appointment will be full-time and the main duties will be in the Bristol Eye Hospital. Normally the holder of this post is appointed Tutor in Ophthalmology in the University of Bristol. The appointment will be subject to the terms and conditions of service of Hospital Medical staff negotiated between the Minister and the Profession.

Applications, stating age, qualifications and experience, and giving the names of 2 referees, should be sent not later than 18th October, 1954, to Secretary to the Board of Governors, Royal Infirmary Branch, Bristol, 2.

BRISTOL. UNITED BRISTOL HOSPITALS. Bristol EYE HOSPITAL. Locum SENIOR HOUSE OFFICER or HOUSE OFFICER required December, 1954, and January, 1955. Previous ophthalmic experience not essential for House Officer.

Applications, stating age, qualifications and experience, and the names and addresses of 2 referees, should be sent not later than 23rd October to the Secretary to the Board, Bristol Eye Hospital, Lower Maudlin-street, Bristol, 1.

BARRY ACCIDENT AND SURGICAL HOSPITAL. CARDIFF HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required immediately at above Hospital. Staffed by whole-time Consultant Surgeon and Senior Casualty Officer. Excellent experience given in general surgery.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

BUSHEY MATERNITY HOSPITAL AND EDGWARE GENERAL HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time OBSTETRICAL AND GYNÆCOLOGICAL REGISTRAR (resident) required at above Hospital. M.R.C.O.G. desirable. Department has 130 obstetrical and 40 gynæcological beds. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Edgware General Hospital, Edgware, Middlesex, by 19th October, 1954.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Temporary RESIDENT ASSISTANT SURGEON (in the grade of Senior Registrar) required for 1 year only from the middle of November.

Apply, with full particulars and names of 3 referees, to the Secretary by 22nd October.

CAMBRIDGE. FULBOURN HOSPITAL. Senior House OFFICER (resident or non-resident). Previous psychiatric experience not required. This Hospital of 976 Beds is linked with the Cambridge University Department of Psychology and Addenbrooke's Hospital, and provides a basic psychiatric training leading to the D.P.M.

Applications, stating age, qualifications and experience, with names of 2 referees, should be sent to Dr. D. H. CLARK, Medical Superintendent, Fulbourn Hospital, near Cambridge, by 18th October, 1954.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (276 Beds.) EAR, NOSE AND THROAT AND EYE DEPARTMENTS. SENIOR HOUSE OFFICER. Salary £745 p.a. Post vacant early December, 1954. Approved for F.R.C.S. and special diplomas.

Applications together with copies of 2 recent testimonials, to be addressed, to the Hospital Secretary at the above Hospital.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of SENIOR REGISTRAR in Obstetrics and Gynæcology in the United Cardiff Hospitals. Candidates should be Members of the Royal College of Obstetricians and Gynæcologists.

Application forms can be obtained from the Secretary, United Cardiff Hospitals, Cardiff Royal Infirmary.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. (840 Beds.) RESIDENT HOUSE SURGEON required for 6 months. Applicants must have completed 12 months Pre-registration Service.

Applications, stating age, qualifications and experience, together with 3 recent testimonials, should be sent to the Group Secretary by 23rd October, 1954.

CATERHAM, SURREY. ST. LAWRENCE'S (MENTAL DEFICIENCY) HOSPITAL. (2256 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required: salary £775–£50–£1075 p.a. Single residential accommodation available at moderate charge; opportunities for further study. London 20 miles.

Applications, giving full particulars and names of 2 referees, to reach Group Secretary by 18th October, 1954.

CHELMSFORD AND ESSEX HOSPITAL. (163 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON (pre-registration post). The post will become vacant on 3rd November, and offers good surgical experience and is recognised for the F.R.C.S.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford, by 19th October, 1954.

CHELMSFORD HOSPITALS. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer) to large surgical units, for a period of 12 months.

Applications, stating age, sex, qualifications, and experience, with recent testimonials, should be sent to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHEPSTOW, MONMOUTHSHIRE. PLASTIC SURGERY, JAW INJURIES AND BURNS CENTRE, ST. LAWRENCE HOSPITAL. (100 plastic surgery, 50 orthopædic beds.) SENIOR HOUSE OFFICER in Plastic Surgery required about 1st November. Previous experience in specialty not essential. The successful candidate will receive a thorough training in plastic surgery and burns. Hospital intakes from most of Wales and provides extensive experience. A second Senior House Officer in Plastic Surgery was recently appointed and there is also a Senior House Officer in Orthopædics. Salary £745, less £150 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary, 64, Cardiff-road, Newport, Mon.

CHESTERFIELD ROYAL HOSPITAL. House Physician required at above Hospital. Pre-registration post or Senior House Officer if person appointed has sufficient experience. 36-Bed unit offering experience in acute general medicine, pædiatrics, diabetics, and dermatology. National salary and conditions.

Apply M. H. BOONE, Secretary, Chesterfield Hospital Management Committee.

CHESTERFIELD ROYAL HOSPITAL. Casualty Officer required at above Hospital. Pre-registration post, or Senior House Officer if person appointed has sufficient experience, and recognised for F.R.C.S. training. Duties include assistance in Accident and Orthopædic Department. National salary and conditions.

Please apply M. H. BOONE, Secretary, Chesterfield Hospital Management Committee.

COLCHESTER HOSPITAL MANAGEMENT COM-MITTEE. Applications are invited for the following posts:—

Essex County Hospital, Colchester (188 Beds)

SENIOR HOUSE OFFICER to Casualty and Radiotherapy Departments. Post tenable for 6 months or 1 year. Recognised for F.R.C.S.

Harwich and District Hospital, Dovercourt (30 Beds)

SENIOR HOUSE OFFICER (Resident Surgical Officer). Post tenable for 1 year.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, 14, Pope's-lane, Colchester, Essex.

DERBY. DERBYSHIRE CHILDREN'S HOSPITAL. (86 Beds.) SENIOR HOUSE OFFICER, vacant October. Post recognised for D.C.H.

Applications, with 2 names for reference, should be sent to the Secretary, No. 1 Hospital Management Committee, Babington-lane, Derby.

DERBY. CITY HOSPITAL. House Surgeon (pre-registration) or SENIOR HOUSE OFFICER, vacant 28th October. Post recognised under F.R.C.S. regulations.

Apply, with copies of 2 recent testimonials, to Medical Superintendent.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Resident SENIOR HOUSE OFFICER (Orthopædic and Accident Service), vacant immediately. Recognised for F.R.C.S.

Apply, with full details and copies of 2 recent testimonials, to Hospital Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Senior HOUSE OFFICER (casualty), vacant immediately. Recognised for F.R.C.S.

Apply, with full details and copies of 2 recent testimonials, to Hospital Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Senior HOUSE OFFICER (ophthalmic), required immediately. Recognised for F.R.C.S.

Apply, with full details and copies of 2 recent testimonials, to Hospital Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds. Post recognised for D.A.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (anæsthetics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 18th October, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DONCASTER HOSPITAL MANAGEMENT COMMIT-TEE. HAMILTON ANNEXE, WESTERN HOSPITAL. (Recognised under the Regulations for the D.Obst.R.C.O.G. and M.R.C.O.G. (obstetrical experience), and approved for Pre-registration Service under the Medical Act, 1950.) Applications are invited for the post of OBSTETRICAL HOUSE OFFICER (Senior House Officer or pre-registration post). Post vacant middle November.

Applications, stating age, nationality, qualifications and experience, and accompanied by copies of 2 testimonials, should be forwarded to the Secretary to the Committee at Doncaster Royal Infirmary.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP. BIRMINGHAM REGION. Applications invited from registered practitioners, for following appointments:—

The Guest Hospital, Dudley (154 Beds)

SENIOR HOUSE OFFICER (Anæsthetist). Post now vacant.

Wordsley Hospital, near Stourbridge (478 Beds)

SENIOR HOUSE OFFICER (resident), Anæsthetist. Post now vacant. In addition to general surgery, experience is available in gynæcology and there is a major Orthopædic Unit. Regional Plastic Surgery Unit at this Hospital.

SENIOR HOUSE OFFICER (surgical).

Applications, stating age, experience, with copies of 3 recent testimonials, to Group Secretary, The Guest Hospital, Dudley, Worcs.

DUMFRIES AND GALLOWAY HOSPITAL BOARD. JUNIOR HOSPITAL MEDICAL OFFICER (tuberculosis and diseases of chest) required for Lochmaben Sanatorium (140 Beds) tuberculosis centre for Dumfries and Galloway. Appointment offers experience in both clinic and hospital work and is suitable for candidates studying for higher degree. Salary £775–£50–£1075.

Apply, with 2 names for reference, to Secretary, Royal Infirmary, Dumfries, within 3 weeks after insertion of this advertisement.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.

(1) MEDICAL REGISTRAR, United Norwich Hospitals. Ward duties at West Norwich Hospital and outpatient clinics at Norfolk and Norwich Hospital. Post provides wide experience in general medicine. Appointment for 1 year, renewable for second year.

(2) ORTHOPÆDIC REGISTRAR, East Suffolk and Ipswich Hospital and Ipswich Borough General Hospital. Post provides wide experience and training in orthopædic surgery. Appointment for 1 year, renewable for second year.

Applications, stating age, experience, and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 18th October, 1954. Candidates invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary at (1) Norfolk and Norwich Hospital and (2) East Suffolk and Ipswich Hospital.

EDGWARE GENERAL HOSPITAL AND BUSHEY MATERNITY HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time GYNÆCOLOGICAL AND OBSTETRICAL REGISTRAR required at above Hospital. Resident when on duty. M.R.C.O.G. desirable. Department has 130 obstetrical and 40 gynæcological beds. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Edgware General Hospital, Edgware, Middlesex, by 19th October, 1954.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. 2 RESIDENT HOUSE SURGEONS for above Hospital. Posts vacant 15th and 17th November, 1954. 6 months appointments. Posts recognised for F.R.C.S. and pre-registration purposes.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 23rd October, 1954.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE PHYSICIAN (Senior House Officer grade) required 17th October, 1954, for general medical and pædiatric duties. 12 months appointment.

Applications, and the names and addresses of 2 referees, to the Secretary of the Management Committee.

EDINBURGH ROYAL VICTORIA AND ASSOCIATED HOSPITALS. SENIOR HOUSE PHYSICIAN required for duties in the Royal Victoria Dispensary, with associated beds in the Royal Victoria Hospital. The post provides excellent experience in preventive, diagnostic and therapeutic aspects of tuberculosis and chest diseases; both Hospital and Clinic are teaching Units linked with the University Department of Tuberculosis and Chest Diseases.

Applications to be submitted within 2 weeks of the appearance of this advertisement to the Secretary, Board's Office, City Hospital, Greenbank-drive, Edinburgh, 10.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds.) RESIDENT SENIOR HOUSE OFFICER (surgery) as Casualty Officer and Orthopædic House Surgeon. Vacancy approximately 3rd November, 1954. Recognised training post for F.R.C.S. Busy general hospital with easy access to London. Salary on national scale less deduction for board, lodging, &c.

Applications, with copies of 2 testimonials, to the Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex, by 22nd October.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (pathology) to fill an immediate vacancy. Salary on national scale, less deduction for board, lodging, &c. Busy department in large general hospital, with easy access to London. Some experience in pathological department desirable.

Applications, with copies of 2 recent testimonials, to reach the Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, immediately.

EPSOM GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for Whole-time REGISTRAR in Chest Medicine to the Epsom and Dorking Chest Clinics, vacant 1st December, 1954. Duties will include sessions at both clinics and charge of 24 beds for pulmonary tuberculosis at Cuddington Hospital under the supervision of the Consultant Chest Physician. Successful candidate will be required to live in the vicinity of the Hospital or resident quarters are available.

Applicants may visit units on request to Group Secretary, Epsom District Hospital, Dorking-road, Epsom, from whom application forms may be obtained (send stamped addressed foolscap envelope) for completion and return by 23rd October, 1954.

EPSOM, SURREY. LONG GROVE HOSPITAL (for mental and nervous disorders). (2300 Beds.) **SOUTH WEST METROPOLITAN REGION.** Applications are invited for an appointment as Whole-time PSYCHIATRIC REGISTRAR. The Hospital affords opportunities for experience of all modern methods of investigation and treatment. There is an extensive outpatients service and facilities are given to study for the D.P.M. (The Hospital is approved for the Conjoint D.P.M.) Self-contained unfurnished accommodation available for married man if required.

Forms of application may be obtained from the Secretary and should be returned to him not later than 2 weeks after the appearance of this advertisement. Candidates will be welcome to visit the Hospital by appointment with the Physician-Superintendent.

EPSOM, SURREY. LONG GROVE HOSPITAL (for mental and nervous disorders). Locum Tenens REGISTRAR required for a period of 2 months from 1st November, 1954. Salary £16 per week. Residential accommodation for a single man or woman available at an appropriate charge.

Applications to the Physician-Superintendent as soon as possible.

FRODSHAM. LIVERPOOL HOSPITAL, Kingswood, FRODSHAM, CHESHIRE. (135 Beds.) Applications are invited from registered medical practitioners for the position of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital, which is for the treatment of pulmonary tuberculosis. Salary in accordance with the national scale—viz., £775–£50–£1075 p.a., less deduction for residence. Resident accommodation for a single person, or house if married.

Applications, stating age, qualifications, and experience, together with the names of 2 referees, should be forwarded to—
Dr. G. S. ERWIN, Physician-Superintendent.

GRIMSBY GENERAL HOSPITAL. Grimsby Hospital MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER for casualty duties required immediately. Resident post. Recognised by Royal College of Surgeons for the Final Fellowship examination. Hours: Normally 9 A.M.–6 P.M. Monday–Friday; 9 A.M.–12 NOON Saturday, sharing night duty on rota with all other resident staff. Establishment consists of Senior Hospital Medical Officer (casualty) and the post now being advertised. The Hospital possesses a well-equipped medical library.

Applications, with the names and addresses of 2 referees, to the Hospital Secretary, Grimsby General Hospital.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (232 Beds.) RESIDENT HOUSE PHYSICIAN required from 1st November. Post is tenable for 6 months and is recognised for pre-registration practitioners.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible.

HASTINGS AND ST. LEONARDS. BUCHANAN HOSPITAL. (94 Beds.) HOUSE SURGEON for Gynæcology (28 gynæcological beds). Post vacant 17th November, for 6 months, is recognised for M.R.C.O.G. Candidates for Pre-registration Service (surgery) can be considered.

Apply, with 3 recent testimonials, to Hospital Administrator.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of HOUSE OFFICER (surgical) at this Hospital, which is approved by the licensing authority for Pre-registration Service. Post vacant at beginning of November.

Applications, giving full particulars, and names of 2 referees, to the Group Secretary, Hospital Management Committee Offices, Newmarket General Hospital, Newmarket, Suffolk.

HITCHIN, HERTFORDSHIRE. LISTER HOSPITAL. Locum RESIDENT ANÆSTHETIST (Senior House Officer grade) required for 2 weeks from 10th November, 1954.

Applications to Medical Administrator.

HUDDERSFIELD. ST. LUKE'S HOSPITAL. (262 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer grade) at the above Hospital to commence duties on 25th October, 1954. The Hospital at present caters for chronic sick, children and maternity patients but during the coming months the work will be extended by the opening of a theatre and acute block. Salary in accordance with the terms and conditions of service for hospital medical and dental staffs, £775–£50–£1075.

Applications, together with copies of 3 recent testimonials, to be sent to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

IPSWICH BOROUGH GENERAL HOSPITAL. (273 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (resident Anæsthetist), now vacant. The post, which is normally of 1 years duration, is recognised for the D.A. and the F.F.A.R.C.S. examinations.

Applications, stating age, nationality, together with recent testimonials, to Hospital Secretary.

ISLE OF THANET HOSPITAL MANAGEMENT COMMITTEE.

General Hospital, Ramsgate (101 Beds)
SENIOR HOUSE OFFICER (surgical).
General Hospital, Margate (132 Beds)
SENIOR HOUSE OFFICER (surgical).

Recognised for F.R.C.S. and D.A. Salary £745 p.a., less charge for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary of appropriate hospital.

KIDDERMINSTER AND DISTRICT GENERAL HOSPITAL. (112 Beds.) Locum HOUSE SURGEON (not pre-registration) required at the above Hospital. Salary £8 per 48-hour week. Post now vacant.

Applications, with the names of 3 referees, to Hospital Secretary.

KINGSTON HOSPITAL, Wolverton-avenue, Kingston-UPON-THAMES. KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited immediately for the unexpected vacancy of SENIOR HOUSE OFFICER (Orthopædic and Casualty Department) on a locum or full-term basis. The post may be resident or non-resident by arrangement.

Applications, stating age, experience and qualifications, to be sent to the Physician-Superintendent of the Hospital immediately, together with 2 recent testimonials.

LANCASTER MOOR HOSPITAL, Lancaster. (Regional MENTAL HOSPITAL.) Applications invited for post of RESIDENT or NON-RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female) on a tenure of 4 years; preference to candidates who have held house appointments at general hospitals. Previous experience in psychiatry not essential. Unfurnished flat in Hospital grounds for married applicants if required; furnished quarters for single persons. Modern methods of investigation and treatment carried out. Out-patient clinics (3) at hospitals in the area, staffed from Hospital.

Applications, stating age, qualifications, and experience, and names of 2 referees, to be sent to the Medical Superintendent.

LEAMINGTON SPA. WARNEFORD-GENERAL HOSPITAL. (207 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP. Applications invited for the post of CASUALTY OFFICER (Senior House Officer), Male or Female, resident or non-resident. Post vacant and suitable for one reading for higher qualifications, affording contact with all specialist units in the Hospital.

Applications, with names and addresses of 3 referees, to Hospital Secretary.

LICHFIELD (near). ST. MATTHEW'S HOSPITAL, BURNTWOOD, near LICHFIELD, STAFFS. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER (psychiatry) at the above Hospital (1300 mental beds). Resident accommodation available.

Applications, with full details and copies of recent testimonials, to Medical Superintendent.

LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER (anæsthetics) for duties mainly at St. James's Hospital. The appointment, which is recognised for the D.A. and the F.F.A.R.C.S., will be for a period of 1 year, and the salary will be in accordance with the agreed terms and conditions of service of hospital medical and dental staffs—namely, £745 p.a., with an appropriate deduction in respect of board, lodging, and other services provided.

Applications, stating age, qualifications, experience &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.
Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS, 2. PUBLIC DISPENSARY AND HOSPITAL. LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER (Senior House Officer) at the above Dispensary. The appointment will be for a period of 1 year. Salary in accordance with the agreed terms and conditions of service of hospital medical and dental staffs, with an appropriate deduction in respect of board, lodging, &c.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.
Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following REGISTRAR posts :—

Ophthalmology

Duties at St. James's Hospital (22 eye beds) and the Public Dispensary, Leeds (non-resident).

Orthopædic Surgery

(*a*) Woodlands Orthopædic Hospital, Rawdon (100 Beds), and Orthopædic Outpatient Department, Bradford Royal Infirmary. Offers excellent training in all branches of accident and orthopædic surgery (may be non-resident).

(*b*) Royal Bath Hospital, Harrogate (40 orthopædic beds). Duties in connection with the Regional Rheumatism Scheme (resident).

(*c*) Duties mainly at Pinderfields General Hospital, Wakefield (70 short-stay and 160 long-stay orthopædic beds), and at other hospitals in the Wakefield A and B Groups (resident).

Otolaryngology

Duties at the Hull Royal Infirmary and associated hospitals (50 E.N.T. beds) (non-resident).

Applications, stating age, qualifications, and details of appointments held showing dates, with names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 21st October, 1954.

LINCOLN. COUNTY HOSPITAL. (200 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in Surgery and E.N.T., the post being recognised for D.L.O.

Apply giving full particulars to—
R. W. HOWICK, Group Secretary.

LIVERPOOL, 18. MOSSLEY HILL HOSPITAL. (145 Beds.) SURGICAL REGISTRAR required for whole-time duty. National Health Service terms and conditions of service.

Detailed applications (9 copies), giving nationality, date of birth, qualifications and experience, including present appointments, and the names of 3 referees, should reach Ministry of Health, Hospital Management Branch, Norcross, Blackpool, Lancashire, by 30th October, 1954.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a temporary post of RADIOLOGICAL REGISTRAR for the period to 30th September, 1955. Reappointment for a further year will be considered without need for further application.

Apply by 23rd October, 1954, on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL EAR, NOSE AND THROAT INFIRMARY. Applications are invited for a post of SENIOR HOUSE OFFICER in Otorhinolaryngology for the period to 30th September, 1955.

Apply as soon as possible on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LLANELLY HOSPITAL. Glantawe Hospital Management COMMITTEE. Applications are invited from registered medical practitioners for the resident appointment of JUNIOR HOSPITAL MEDICAL OFFICER in the E.N.T. Department of the above Hospital. Salary £775–£50–£1075.

Applications, with full details of experience, qualifications and age, together with the names of 2 referees, should be sent to the Hospital Secretary, Llanelly Hospital, Llanelly, Carms.

LLANELLY HOSPITAL (166 Beds.) **Glantawe Hospital** MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident) for work in the Surgical Unit of 75 Beds. The post offers excellent experience in general surgery.

Applications, stating age, experience and qualifications, to be addressed to the Hospital Secretary, Llanelly Hospital, Marble Hall-road, Llanelly.

LLANELLY HOSPITAL, Llanelly, Carmarthenshire. (166 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER for duty in the E.N.T., Ophthalmic and Gynæcological Departments.

Full particulars, stating age, qualifications and experience, should be addressed to the Hospital Secretary, Llanelly Hospital, Marble Hall-road, Llanelly.

MANCHESTER AND SALFORD HOSPITAL FOR SKIN DISEASES, Quay-street, MANCHESTER, 3. SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (resident), now vacant. The appointment is for a period of 12 months.

Applications, stating age, qualifications with dates, nationality and accompanied by copies of 2 recent testimonials, to be sent to Hospital Secretary.

MANCHESTER, 9. BOOTH HALL CHILDREN'S HOSPITAL. RESIDENT SENIOR HOUSE OFFICER (medical). Post vacant November. Candidates should preferably, but not necessarily, have had previous paediatric experience.

Applications, stating age, nationality and usual relevant particulars, and enclosing copies of 2 recent testimonials, should be sent to the Medical Superintendent as soon as possible.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for a post of REGISTRAR in the Obstetric and Gynæcology Department in the Barrow and Furness Group of hospitals. 72 obstetric/gynæcological beds in main unit; Outpatient Departments and extensive surgical experience. Recognised for D.Obst.R.C.O.G.

Applications to Group Secretary, Barrow and Furness Hospital Management Committee, 52, Paradise-street, Barrow-in-Furness, not later than 16th October, 1954.

MANCHESTER REGIONAL HOSPITAL BOARD. Birch HILL HOSPITAL. REGISTRAR in Obstetrics and Gynæcology. Post now vacant. Modern, busy unit. Recognised for D.Obst. R.C.O.G.

Apply at once to the Superintendent, Birch Hill Hospital, Rochdale, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD. LANCASTER MOOR HOSPITAL, LANCASTER. (REGIONAL MENTAL HOSPITAL.) Applications invited for post of RESIDENT or NON-RESIDENT REGISTRAR (Male or Female). Preference to candidates who have held house appointments at general hospitals. Unfurnished flat or house in Hospital grounds available for married applicants if required; furnished quarters for single persons. Modern methods of investigation and treatment carried out. Outpatients clinics (3) staffed from Hospital.

Applications, stating age, qualifications, and experience, and names of 2 referees, to be sent to the Medical Superintendent.

MANCHESTER REGIONAL HOSPITAL BOARD. Bury AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for REGISTRAR in Surgery at Bury General Hospital, the post falling vacant in October. Post recognised for F.R.C.S.

Applications, together with the names of 2 referees, should be sent to H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD. REGISTRAR in Anæsthetics to the Bolton and District Group of hospitals, with main duties at Bolton Royal Infirmary and Bolton District General Hospital. Now vacant, recognised for the D.A. and F.F.A.R.C.S.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, should be sent immediately to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

MAIDENHEAD HOSPITAL, St. Luke's-road, Maidenhead. RESIDENT SURGICAL REGISTRAR required at above Hospital. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 17th October.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER in the Ophthalmic Department of the above Hospital. The Hospital is recognised by the Examining Boards for the F.R.C.S. and the D.O. Appointment will be for 12 months. Salary £745 a year, less £150 a year for residential emoluments. Post now vacant.

Applications should be forwarded as soon as possible to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Church-street, Maidstone.

NEWPORT, MONMOUTHSHIRE. ROYAL GWENT HOSPITAL. (260 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (E.N.T. and ophthalmic) required 1st November. National salary, less £125 board-residence. Grade depends on period since qualification. Recognised D.L.O. Covers 23 E.N.T. and 8 eye beds.

Write, quoting 2 referees, to T. A. JONES, Group Secretary, 64, Cardiff-road, Newport, Mon.

NORTHAMPTON. ST. ANDREW'S HOSPITAL. Applications are invited from registered medical practitioners for the appointment of REGISTRAR in Psychiatry. Facilities for research and advanced studies are available. The successful candidate will work in the Hospital and outpatient clinics. Salary £700 p.a., together with full residential emoluments, valued for superannuation purposes at £150 p.a. If married, unfurnished house will be provided with light, coal, laundry, and garden produce. The Hospital operates outside the National Health Service but reciprocity has been granted between the National Health Service superannuation scheme and the Hospital superannuation scheme so that years of service are transferable in either direction.

Applications, stating age, qualifications, experience, &c., together with copies of 3 recent testimonials, to be addressed to the Medical Superintendent.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

ORTHOPÆDIC REGISTRAR (resident), Tilbury and Riverside General Hospital.

Appointment subject to review after 1 year.

Applications in triplicate, with 3 copies of 2 recent testimonials, to Secretary, 11A, Portland-place, W.1, by 23rd October, 1954.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (non-resident) in Pathology required at the Group Laboratory, Peace Memorial Hospital, Watford. Appointment tenable for 2 years. Previous experience essential.

Application forms obtainable from, and returnable to, Group Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, by not later than 10 days after the appearance of this advertisement.

NOTTINGHAM AND MIDLAND EYE INFIRMARY. Required, SENIOR HOUSE OFFICER and HOUSE SURGEON for the above Hospital. Duties to commence on or about 20th October, 1954. Salaries and conditions of service in accordance with Ministry regulations.

Applications, stating age, qualifications and experience, together with testimonials, to be sent as soon as possible to—
HENRY M. STANLEY, Group Secretary.

General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered general practitioners for the post of THIRD CASUALTY OFFICER (Senior House Officer grade). Salary (less £150 emoluments) and conditions of service in accordance with those laid down by the Ministry. Duties to commence as soon as possible. This post offers wide experience of casualty work. The Staff establishment requires only 1 night in 3 emergency work, and off duty permits time for study for higher examinations.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—
General Hospital, Nottingham. HENRY M. STANLEY.

NOTTINGHAM GENERAL HOSPITAL. Locum Third CASUALTY OFFICER required (Senior House Officer grade). Salary (less £150 emoluments) and conditions of service in accordance with Ministry regulations.

Applications, giving full details, to be sent to—
General Hospital, Nottingham. HENRY M. STANLEY.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR ORTHOPÆDIC AND FRACTURE HOUSE OFFICER (locum tenens considered). The post offers exceptional experience in traumatic surgery. Duties to commence at the end of November. Salary and conditions of service in accordance with Ministry regulations. If resident £150 deducted for emoluments.

Applications, stating age, qualifications and experience, together with copies of testimonials to be sent to—
HENRY M. STANLEY, Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners (Male or Female—locum tenens considered) for the post of RESIDENT SENIOR ANÆSTHETIC HOUSE OFFICER. Duties to commence as soon as possible. Terms and conditions of service in accordance with published regulations of the Ministry of Health, £150 deducted for residential emoluments.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—
HENRY M. STANLEY, Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited for the post of CLINICAL PATHOLOGIST (Senior House Officer grade), resident or non-resident, vacant 1st December. Previous experience in pathology not essential. Opportunities for training in all branches of clinical pathology are afforded in a department serving over 1200 beds. Salary and conditions of service in accordance with Ministry regulations.

Applications, with names and addresses of 3 referees, should be received before 30th October, addressed to the Secretary.

NORWICH. HELLESDON HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER. This Mental Hospital of 1100 Beds, including a separate Neurosis Unit, serves 3 Outpatient Departments and 1 Child Guidance Clinic and maintains Occupational Therapy, E.E.G., Social Workers, and Clinical Psychologist Departments. Salary £745 p.a. A flat would be available for a married man at a rental of £1 per week.

Applications, with names and addresses of 2 referees, to the Medical Superintendent.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for the post of NON-RESIDENT REGISTRAR to the Department of Radiotherapy, Churchill Hospital, Oxford, commencing 1st December, 1954. Training includes clinical use of radioactive isotopes as well as other forms of radiotherapy. Recognised as training centre for D.M.R.T. Previous experience not essential.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 14th October, 1954.

PENZANCE. WEST CORNWALL HOSPITAL. WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE PHYSICIAN to commence duty on 14th November. Recognised as pre-registration appointment.

Applications to the Hospital Secretary.

PERTHSHIRE MENTAL HOSPITALS. House Physicians (recognised pre-registration posts), at the Murray Royal Hospital, Perth (260 Beds), and The Hospital, Murthly, Perthshire (460 Beds).

Applications, with names of 2 referees, to the Group Physician-Superintendent, Murray Royal, who will on request answer inquiries or arrange for a visit to the Hospital.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, Greenbank-road. Applications invited from registered dental practitioners for the appointment of RESIDENT DENTAL HOUSE SURGEON, vacant immediately. This appointment is recognised by the Royal College of Surgeons as fulfilling the requirements of candidates for the Fellowship of Dental Surgery.

Applications, stating age, nationality, and experience, together with copies of 3 recent testimonials, should be sent to—
ARTHUR R. CASH, Group Secretary, Plymouth.
South Devon and East Cornwall General Hospital Group.
7, Nelson gardens, Stoke, Plymouth.

POOLE GENERAL HOSPITAL, Longfleet-road, Poole, DORSET. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (anæsthetics). The Hospital is recognised for the D.A., and the F.F.A.R.C.S.

Applications to the Hospital Secretary.

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road, REDHILL, SURREY. SENIOR HOUSE OFFICER (mainly surgical) required at above Hospital.

Apply to the Hospital Secretary.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) HOUSE SURGEON (resident) required from 1st November, 1954, in the Obstetric and Gynæcological Unit consisting of 96 obstetric beds and 52 gynæcological beds. Post is approved for pre-registration purposes and recognised for D.Obst.R.C.O.G. and M.R.C.O.G.

Apply to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER required in the Department of Ophthalmology.

Applications should be addressed immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male) required. (Post not approved for pre-registration purposes.)

Applications should be forwarded to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

READING AREA HOSPITALS. Applications are invited for post of SENIOR HOUSE OFFICER or JUNIOR HOUSE OFFICER (pathology). Previous experience in pathology desirable but not essential. Salary £745 or £525 p.a. respectively, less £125 board-residence.

Apply, stating age, qualifications with dates, nationality, present post, together with copies of recent testimonials, to Group Secretary, 3, Craven-road, Reading.

READING. ROYAL BERKSHIRE HOSPITAL. (403 Beds.) Applications are invited from registered medical practitioners for the appointment of JUNIOR HOUSE SURGEON (gynæcology), vacant 1st November. Post M.R.C.O.G. recognised and tenable for 6 months. £525 p.a., less £125 for board-residence.

Write, stating age, qualifications with dates, nationality, and present post, with copy of a recent testimonial, to the Secretary.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Medicine for duty within the Rheumatic Unit at the Northern General Hospital, Edinburgh. The Unit undertakes considerable amount of research work and preference will be given to candidates with some previous experience in the treatment of rheumatic disorders. The appointment is subject to the terms and conditions of the National Health Service.

Applications, giving particulars of age, qualifications, and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh gardens, Edinburgh, 3, by 23rd October, 1954.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Obstetrics and Gynæcology at the Elsie Inglis and Bruntsfield Hospitals, Edinburgh. The successful applicant may be required to reside in the Elsie Inglis Hospital. The appointment is subject to the terms and conditions of the National Health Service.

Applications, giving particulars of age, qualifications, and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh gardens, Edinburgh, 3, by 23rd October, 1954.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Obstetrics and Gynæcology in the Professorial Unit at the Royal Infirmary of Edinburgh and the Simpson Memorial Maternity Pavilion. The appointment is subject to the terms and conditions of the National Health Service.

Applications, giving particulars of age, qualifications, and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 23rd October, 1954.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in the Regional Pool of Anæsthetists based on the Royal Infirmary of Edinburgh. The appointment is subject to the terms and conditions of the National Health Service.

Applications, giving particulars of age, qualifications, and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 23rd October, 1954.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD invite applications for a post of SENIOR REGISTRAR in Biochemistry in the Regional Laboratory at the Royal Northern Infirmary, Inverness.

Further particulars and forms of application are obtainable from the undersigned, to whom applications should be sent by 23rd October, 1954. A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments:—

SENIOR REGISTRAR in Medicine, Hairmyres Hospital, East Kilbride.
SENIOR REGISTRAR in Medicine, Royal Alexandra Infirmary, Paisley.
SENIOR REGISTRAR in Medicine, County Hospital, Stonehouse.
SENIOR REGISTRAR in Medicine, Royal Infirmary, Greenock.
SENIOR REGISTRAR in Medicine, Ballochmyle Hospital, Mauchline.
SENIOR REGISTRAR in Medicine, Victoria Infirmary, Glasgow.
2 SENIOR REGISTRARS in Medicine, Royal Infirmary, Glasgow.
SENIOR REGISTRAR in Medicine, Kilmarnock Infirmary.
SENIOR REGISTRAR in Surgery, Law Hospital, Carluke.

These are transitional posts tenable for 1 year and are offered to candidates who have completed 3 or more years of training as Senior Registrars.

Above appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (3 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, by 30th October, 1954.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

REGISTRAR in Medicine at Law Hospital, Carluke.

REGISTRAR in Pathology at Western Infirmary, Glasgow.

REGISTRAR in Surgery at the Royal Infirmary, Glasgow.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, *Western Regional Hospital Board*, 64, West Regent-street, Glasgow, by 30th October, 1954.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. *HOUSE SURGEON* to the Orthopædic Department. This appointment, which is for 6 months, is open to pre-registration candidates and is vacant at present.

Applications, stating age, nationality, and naming 2 referees, should be submitted to the Group Secretary, Odstock Hospital, *Salisbury*.

SALISBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of *DENTAL REGISTRAR to the Plastic and Oral Surgery Centre* at Odstock Hospital. Post approved for the Dental Fellowship. Candidates may visit the Unit by appointment.

Application forms obtainable from the Group Secretary, Odstock Hospital, Salisbury, should be returned within 14 days of the appearance of this advertisement.

SHEFFIELD. CITY GENERAL HOSPITAL. (642 Beds. *Recognised training hospital for the F.R.C.S.*) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (orthopædics) required. Appointment for 1 *year in first instance.*

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 18th October, 1954, giving age, *nationality, qualifications, present and previous appointments* with dates, naming 3 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT SENIOR MEDICAL REGISTRAR for the Leicester Royal Infirmary. Appointment for 1 year in the first instance, reviewable annually. It has been agreed between the Sheffield Regional Hospital Board and the Board of Governors of the United Sheffield Hospitals that, subject to satisfactory work and progress, the tenure of the appointment will be divided between the Leicester Royal Infirmary and 1 of the Teaching Hospitals.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with the names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10, to arrive not later than 25th October, 1954.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the following non-resident posts :—

(*a*) SURGICAL REGISTRAR at the Royal Hospital. Closing date for applications 23rd October, 1954.

(*b*) REGISTRAR to the Department of Dermatology at the Royal Infirmary Unit. Post vacant. A higher qualification preferable. Applications should be sent immediately for this post.

Applications for the above posts should state age, qualifications, and experience, with the names of 3 referees, and be sent to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL HOSPITAL UNIT. Applications invited for the following posts :—

(*a*) RESIDENT SENIOR HOUSE OFFICER in Clinical Pathology. Post vacant 14th October. Pathological experience not essential but candidates must have previous clinical experience. The successful candidate will be responsible for emergency pathological and blood-transfusion work at the Hospital and will work in turn in the different branches of clinical pathology in the laboratories of The United Sheffield Hospitals.

(*b*) NON-RESIDENT SENIOR HOUSE OFFICER in Ophthalmology. Post vacant.

Applications should state age, qualifications and experience, give the names of 3 referees, and be sent immediately to the Superintendent, Royal Hospital, Sheffield, 1.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. Locum RESIDENT SENIOR SURGICAL REGISTRAR required from 18th–24th October. Person appointed may be required to do emergency work at other hospitals within Group and possession of car an advantage.

Applications, with copies of 3 testimonials, to Secretary.

SOUTHAMPTON EYE HOSPITAL. (32 Beds. Recognised for the D.O.M.S.) RESIDENT SENIOR HOUSE OFFICER required immediately. Salary £745 p.a.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON GENERAL HOSPITAL. (471 Beds.) HOUSE PHYSICIAN (resident) required early in November. Post tenable for 6 months. Pre-registration candidates eligible.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds. Recognised for F.R.C.S.) RESIDENT HOUSE SURGEON required end of October. Pre-registration candidates eligible.

Applications, with copies of testimonials, should be forwarded to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton, as soon as possible.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Part-time REGISTRAR in Dermatology required for :—

(i) 2 half-day sessions a week at St. Helier Hospital, Carshalton, Surrey ;

(ii) 1 half-day session a week at Kingston Hospital.

Application forms obtainable from, and returnable to, the Group Secretary, St. Helier Hospital, Carshalton, Surrey, by 30th October, 1954.

STOCKPORT. STEPPING HILL HOSPITAL. (490 Beds.) *Applications are invited for the post of RESIDENT* SENIOR HOUSE OFFICER (surgery). The post is recognised for the F.R.C.S.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire, immediately.

STOCKPORT INFIRMARY, Stockport. (162 Beds.) Applications are invited for the post of SENIOR HOUSE *OFFICER (Resident Surgical Officer). The post is recognised for the F.R.C.S.*

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire.

STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. *Applications invited for RESIDENT ASSISTANT* CLINICAL PATHOLOGIST to the Stoke-on-Trent Group of hospitals, vacant now. Single accommodation available at *the North Staffs Royal Infirmary. The post is of Junior Hospital Medical Officer status, but applications from practi*tioners with less than the required 2 years qualification period will be considered, in the grade of Senior House Officer. The post offers exceptional experience in hospital laboratory work and the laboratory is recognised for the Diploma in Clinical Pathology and also for the Diploma in Pathology.

Applications, stating age, nationality, and full details of previous appointments held, together with copies of 3 recent testimonials, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

SULLY HOSPITAL, Sully, Penarth, Glamorgan. (Thoracic Centre—324 Beds.) CARDIFF HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (medical) required immediately. Experience gained in treatment of chest diseases in adults and children.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of ANÆSTHETIST (Senior House Officer grade) at Swansea Hospital. The Hospital is recognised under D.A. regulations.

Applications, stating age, qualifications and experience, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

SWANSEA. MOUNT PLEASANT HOSPITAL. Glantawe HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER (Female) for work in the Medical and Surgical Departments, and in the chronic sick wards of the above Hospital.

Applications, stating age, experience and qualifications, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

UXBRIDGE CHEST CLINIC. Full-time Registrar required. Duties at Clinic and Hillingdon Hospital, female tuberculosis ward (30 Beds). Residence at Hillingdon Hospital available, if desired. Experience in general medicine desirable, in tuberculosis essential. Clinic and Hospital may be visited by direct appointment. Post vacant early January.

Application forms obtainable from, and returnable to, Group Secretary, Uxbridge Group Hospital Management Committee, The Furze, Pield Heath-road, Uxbridge, Middlesex, by 1st November, 1954.

WARLINGHAM PARK HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Registered medical practitioners are invited to apply for the appointment of REGISTRAR, vacant on 1st January, 1955. Opportunity will be given for experience in all branches of psychiatry, psychoneurosis, industrial psychiatry, delinquency and child guidance. Candidates may visit the Hospital (by arrangement with the Medical Superintendent) but canvassing in any way will disqualify.

Applications for forms of application (5 copies required to be completed) must be accompanied by a stamped addressed envelope and made to the Secretary, Warlingham Park Hospital Management Committee, Warlingham Park Hospital, Warlingham, Surrey, and returned to him within 14 days of the appearance of this advertisement.

WARRINGTON INFIRMARY. Applications are invited from qualified practitioners for the vacancy of RESIDENT ANÆSTHETIST (Senior House Officer grade), Male or Female, at the Warrington Infirmary. The Infirmary is recognised for the D.A. examination. Scale of salary £745 p.a., less £130 p.a. for residential emoluments.

Applications to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in General Surgery required for duty at Billinge Hospital, Orrell, near Wigan (370 Beds), vacant in October.

Applications, with names of 2 referees, to Secretary, Knowsley House, Wigan.

WINDSOR. KING EDWARD VII HOSPITAL. *Obstetric* AND GYNÆCOLOGICAL HOUSE SURGEON required, Male or Female, for post vacant 1st December. Obstetric post recognised for D.Obst.R.C.O.G. Successful candidate will be resident at Old Windsor Unit of Hospital. Applicants required to be members of Medical Protection Society.

Applications, stating age, nationality, qualifications with *dates, with copies of recent testimonials or names of 3 referees,* to Hospital Secretary by 30th October.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR *(ophthalmology)* based at *Llanelly Hospital* (24 ophthalmic beds). May also be expected to serve other hospitals within Group (non-resident). Opportunity for study and operative work under supervision.

REGISTRAR, North Wales Child Guidance Clinics. Establishment of clinics includes Consultant, Play Therapist, Psychologist, 3 Psychiatric Social Workers. Central Clinic at Colwyn Bay and peripheral clinics serving North Wales Area.

SENIOR REGISTRAR in Psychiatry, North Wales Hospital for Nervous and Mental Disorders, Denbigh. Hospital provides comprehensive Mental Health Service for North Wales. Outpatient clinics at major general hospitals and associated Child Guidance Services. Every modern Therapy, and Departments of Psychology and Electro-encephalography. Modern open-door reception *units with annual admission-rate over 800.* Satisfactory accommodation for married man and family available.

REGISTRAR (general surgery), St. Woolos Hospital, Newport *Mon (379 Beds). Post covers 56 surgical beds. Non-resident.* Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, *Temple of Peace, Cathays Park, Cardiff, within 14 days.*

WEST DORSET GROUP OF HOSPITALS. A Locum Tenens REGISTRAR in Anæsthetics is immediately required for *2 months for the above Group. Remuneration at the locum* rates of £16 per week.

Applications to Area Secretary Western Area Committee, South West Metropolitan Regional Hospital Board, Highcroft, *Romsey-road, Winchester.*

WOKING. THE ROWLEY BRISTOW ORTHOPÆDIC HOSPITAL, PYRFORD, WOKING. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ROWLEY BRISTOW GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of REGISTRAR (non-resident), vacant early in January.

Applications to be on forms obtained from the Group Secretary at the above address and completed forms should be returned within 14 days of the date of this advertisement. Canvassing will disqualify, but candidates may visit the Hospital.

WOLVERHAMPTON GROUP.

The Royal Hospital, Wolverhampton (An Associated Hospital of the University of Birmingham Medical School)

SENIOR HOUSE OFFICER (anæsthetist). Appointment recognised for D.A. and F.F.A.R.C.S. Vacant 15th November.

Applications, with copies of 3 recent testimonials, to be sent to Group Secretary, The Royal Hospital, Wolverhampton.

WORCESTER (near). POWICK HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident or non-resident). The post offers experience in all branches of psychiatry, including all forms of modern treatment and outpatient clinics. The Hospital has a high admission-rate, is recognised for the D.P.M., and has associated Child Guidance Clinics and a Mental Deficiency Institute similarly recognised. Arrangements are made for Medical Officers to attend at the Birmingham Medical School for instruction in neurology.

Applications, with full details and the names of 2 referees, to be forwarded to the Medical Superintendent.

YORKSHIRE. EAST RIDING HOSPITAL MANAGE- MENT COMMITTEE.

Westwood Hospital, Beverley, Yorks (229 Beds)

(*a*) SENIOR HOUSE PHYSICIAN, vacant end October.

(*b*) ASSISTANT PATHOLOGIST (Senior House Officer) required in Area Laboratory, with attendance Branch Laboratory at Driffield. Offers experience all branches pathology.

East Riding General Hospital, Driffield, Yorks (269 Beds)

(*c*) HOUSE PHYSICIAN (first, second, or third post), vacant 1st November. Approved pre-registration post. Duties include acute and chronic sick and casualties. Good experience for first house appointment.

Northfield Sanatorium, Driffield, Yorks (78 Beds)

(*d*) SENIOR HOUSE PHYSICIAN, vacant now. Offers experience all branches tuberculosis within Group, including surgery, M.M.R. and clinics. Time for study. Ex-patients welcome.

Broadgate (Mental) Hospital, Beverley, Yorks (650 Beds)

(*e*) JUNIOR HOSPITAL MEDICAL OFFICERS (2), required now.

Salary for (*c*) is £425–£525; for (*a*), (*b*) and (*d*) is £745; and for (*e*) is £775–£50–£1075. Fully qualified practitioners may apply for the pre-registration posts.

Detailed applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

NEW YORK. NEW ROCHELLE HOSPITAL, New ROCHELLE, NEW YORK, U.S.A. (360-Bed general community hospital.) Approved by the Joint Commission on Accreditation of Hospitals. Also approved by the American College of Surgeons and American Medical Association for internship and residency training. Only graduates from approved university schools accepted. 2 INTERNSHIPS available for the term commencing 1st January, 1955. Stipend is $200 per month, plus complete maintenance. Passage back to England paid by Hospital after completion of 12-month internship.

Apply Superintendent.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a whole-time post as REGISTRAR in Orthopædic Surgery at hospitals managed by the South Belfast Hospital Management Committee. The terms and conditions will be in accordance with the application of the Spens report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) *from the Secretary, Northern Ireland Hospitals* Authority, 44–46, Queen-street, Belfast, and to be returned not later than 13th November, 1954.

Public Appointments

BLACKPOOL. COUNTY BOROUGH OF BLACKPOOL. SCHOOL MEDICAL SERVICE. Applications are invited for the appointment of FIRST ASSISTANT SCHOOL MEDICAL OFFICER from registered medical practitioners (Male or Female). Preference will be given to applicants with experience in the examination and treatment of children and in the assessment of educationally retarded children. The possession of the D.P.H. and/or D.C.H., with experience in refraction work, will be an advantage. The salary payable in respect of the appointment will be £1100 p.a., rising by annual increments of £50 to a maximum of £1400 p.a. and experience and qualifications will be taken into account when fixing the commencing salary. The appointment will be subject to the provisions of the National Health Service (Superannuation) Regulations, *1947 and 1948, and the person appointed will be required to* contribute to the superannuation fund maintained by the Council.

Forms of application and conditions of appointment may be obtained from the Medical Officer of Health and Principal School Medical Officer, Municipal Health Centre, Whitegate-drive, Blackpool, and should be returned to reach him not later than *Saturday, 30th October, 1954.*

TREVOR T. JONES, Town Clerk.

BUCKINGHAMSHIRE. COUNTY OF BUCKS. Borough OF SLOUGH. *Applications are invited from registered medical* practitioners holding the qualifications prescribed by the Sanitary Officers (Outside London) Regulations, 1935 and 1951, *for the whole-time joint appointment of* ASSISTANT COUNTY MEDICAL OFFICER AND DEPUTY MEDICAL OFFICER OF HEALTH for the Borough of Slough. Salary within the scale of £979 3s. 4d.–£1323 9s. 8d. p.a. Travelling and subsistence allowances will be paid on the County Council's scale. The appointment is superannuable, and subject to medical examination.

Further particulars and forms of application may be obtained from the undersigned, to whom applications must be delivered by 30th November, 1954.

GUY R. CROUCH, Clerk of the Bucks County Council.
NORMAN T. BERRY, Town Clerk, Slough.

DURHAM. COUNTY COUNCIL OF DURHAM. Health DEPARTMENT. Applications are invited from registered medical practitioners (Female) for the post of ASSISTANT MATERNITY AND CHILD WELFARE MEDICAL OFFICER at a commencing salary of £950 p.a., rising by annual increments of £50 to £1300 p.a. Travelling expenses will be paid in accordance with a scale approved by the Whitley Council. Canvassing, directly or indirectly, will disqualify.

The appointment is subject to certain conditions, particulars of which may be obtained from the County Medical Officer of Health, Shire Hall, Durham, to whom applications, together with the names of not more than 3 referees, should be sent not later than Saturday, 16th October, 1954.

J. K. HOPE, Clerk of the County Council.

Shire Hall, Durham, September, 1954.

LINCOLN. COUNTY OF LINCOLN—Parts of Kesteven. Applications are invited from registered medical practitioners *holding a Diploma in Public Health for the joint appointment of* ASSISTANT COUNTY MEDICAL OFFICER AND MEDICAL OFFICER OF HEALTH for the Borough of Grantham and the West Kesteven Rural District (population approximately 39,000). The inclusive salary will be £1368 15s., rising by annual increments (4 of £56 5s. and 3 of £31 5s.) to £1687 10s. Commencing salary according to experience. The appointment will be superannuable.

Application forms, together with terms and conditions of appointment, can be obtained from the undersigned, and should be returned within 3 weeks of the appearance of this advertisement. Canvassing either directly or indirectly will disqualify.

J. E. BLOW, Clerk of the County Council.

County Offices, Sleaford, Lincs., October, 1954.

UNITED KINGDOM ATOMIC ENERGY AUTHORITY
MEDICAL OFFICER
required by the
ATOMIC WEAPONS RESEARCH ESTABLISHMENT, ALDERMASTON, BERKS.

General duties in preventive and industrial medicine, of which applicants should have had several years experience. The salary range is £1420, rising to £2000 p.a., and pay on entry will be determined by age, qualifications, and experience. In addition, a responsibility allowance will be payable as the selected candidate will be regarded as the deputy to the Principal Medical Officer. A house will be available within a reasonable period of time for the selected candidate who is married and lives outside the radius of the Establishment's transport facilities.

Applications quoting reference 246/WGE/75 to the Senior Recruitment Officer, A.W.R.E., Aldermaston, Berkshire.

BAHRAIN, PERSIAN GULF. GOVERNMENT OF BAHRAIN MEDICAL DEPARTMENT invites applications from British Male Doctors for the post of MEDICAL OFFICER. Age 28–33. Minimum salary £1494, rising £45 annually, no allowances. Non-contributory gratuity on retirement. Private practice among Europeans only. No income-tax. Free quarters with hard furniture and car. Agreement for 2 years, renewable, with 5 months home leave on full pay, and free air passages every 2 years.

Applications should be addressed to MESSRS. CHAS. KENDALL & PARTNERS LTD., 7, Albert-court, Kensington Gore, London, S.W.7.

BRITISH TRANSPORT COMMISSION (British Railways). LONDON MIDLAND REGION. Applications are invited from Male registered medical practitioners, aged 30–40, for appointment as ASSISTANT MEDICAL OFFICER in the London Midland Region, British Railways. Candidates should have a good clinical background and an interest in Industrial Medicine. Experience in general practice is desirable. Salary on appointment £1200 p.a., and membership of the Superannuation Fund, subject to medical examination, obligatory.

Applications, giving full particulars of age, qualifications and experience and 2 references, should be sent to the Regional Medical Officer, British Railways, London Midland Region, 66, Drummond-street, Euston, N.W.1, not later than 16th October, 1954.

HER MAJESTY'S OVERSEA CIVIL SERVICE. (Medical BRANCH.) SEYCHELLES. MEDICAL OFFICER (with surgical qualifications or experience) required in the Seychelles. Candidates must possess medical qualifications registrable in the United Kingdom and have either F.R.C.S. or experience as a Senior Surgical Registrar. Appointment on probation for permanent employment with pension (non-contributory) at the age of 50–55. Candidates in the National Health Service may resign from the National Health Service but retain their superannuation rights (up to 6 years) and receive a gratuity of 20% of the aggregate of their salary at the end of their engagements. Salary scale from Rs. 11,800 to Rs. 16,420 (£885–£1231 10s.) a year—starting salary according to qualifications and experience. Other emoluments are temporary non-pensionable cost-of-living allowance payable at present at rate of 10% of basic salary, an allowance as Surgeon amounting to Rs. 1334 (£100 approximately) a year and half operation fees which may amount to about £150 a year. Free passages in both directions for officer and family up to cost of 3 adult fares. Income-tax at local rates. Furnished quarters provided at rental of 10% of basic salary. Generous home leave granted after each tour of duty of 3 years.

Application forms from Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD. 117/54/04).

NATIONAL COAL BOARD. Scottish Division. Applications are invited for a full-time appointment as MEDICAL OFFICER to the Central East Area of the Scottish Division. Duties will embrace the usual functions of Industrial Medical Officers. Candidates should have had experience in general practice and/or in the field of preventive and industrial medicine. Knowledge of the coalmining industry will be an advantage. Salary will be within the range of £1250–£1900 p.a. according to qualifications, age and experience. Membership of the Board's superannuation scheme, subject to medical examination, is obligatory.

Applications, giving full particulars of age, qualifications, experience (in chronological order), present appointment and salary, together with 3 references, should be sent to the Establishments Officer, National Coal Board, 1, Eglinton-crescent, Edinburgh, 12, within 7 days. Original testimonials should not be sent.

WALSALL. COUNTY BOROUGH OF WALSALL. ASSISTANT MEDICAL OFFICER OF HEALTH. Applications are invited from qualified medical practitioners for the above post at a salary of £950 p.a., rising by annual increments of £50 to £1300 p.a. Possession of the D.P.H. or D.C.H. will be considered an advantage. Commencing salary according to qualifications and experience.

Further particulars and application forms may be obtained from me. W. STALEY BROOKES, Town Clerk.

Council House, Walsall.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy"

DUDLEY, WORCESTERSHIRE. Applications invited for death VACANCY. List at present approximately 4000. "Designated" area. Residence and surgery may be available. Apply on Form E.C.16A (obtainable from the undersigned) not later than 20th October, 1954, to—

Miss A. WEBB, Clerk, Dudley Executive Council.
193, Wolverhampton-street, Dudley, Worcs.

ZETLAND EXECUTIVE COUNCIL. Applications are invited from registered medical practitioners to fill the VACANCY in the medical service area in the island of Unst, Shetland Islands. Persons on list number approximately 1000, and there is a mileage payment available in the practice. Dispensing practice. A house is available. Applications stating age, qualifications and experience, together with copies of recent testimonials, should be lodged on or before 23rd October, 1954, with the Clerk, Zetland Executive Council, Commercial-street, Lerwick, from whom further particulars can be obtained. Canvassing in any form will be a disqualification.

BIRMINGHAM, HANDSWORTH. Applications invited for VACANCY (urban) due to death. List approximately 2550. Residence and surgery available. Apply on E.C.16A not later than 23rd October, 1954, to—

K. F. G. DAY, Clerk of the Birmingham Executive Council.
Sutton New-road, Erdington, Birmingham, 23.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies.

Assistant Doctor required early January for Anglican Native Mission Hospital (Government supported). 100 Beds. Salary £626, including cost-of-living allowance for single Man or Woman. Extra £50 for married man.—Applications, with details of previous experience and references to Medical Superintendent, St. Barnabas Mission Hospital, Ntlaza, Umtata, C.P. South Africa.

Medical Officer required by Falkland Islands Dependencies Survey for tour of 18 or 30 months service in Antarctic Bases. To leave U.K. end of November, 1954. Salary £625 a year. Free passages, quarters, messing and canteen stores. Liberal leave on full salary. Candidates must possess qualifications registrable in the United Kingdom.—Write to the Crown Agents, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M3A/34383/LD.

Major Pharmaceutical Company requires registered Medical Practitioner with fluent Spanish or Italian for post based on this country. The work includes supplying medical information in response to queries, and occasional visits to Spain or Italy as an adviser. Starting salary not less than £1250.—Apply: Address, No. 970, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

The Research Department of the Pharmaceuticals Division of Imperial Chemical Industries Ltd. invites application from young medical men for the position of Histopathologist. An interest in histochemical research will be regarded as an asset. Salary according to experience.—Applications should be addressed to the Research Director, I.C.I. Ltd., Pharmaceuticals Division, Hexagon House, Blackley, Manchester. Suitable applicants will be interviewed during the month of December.

Manitoba, Canada. Medical Practice, house, furniture (if required) for disposal. Gross income $22,000 p.a., equalling over £7000.—Full particulars: ARTHUR SHAW, Medical Agent, Premier Buildings, 88, Church-street, Liverpool, 1.

Part-time Secretary to Consultant-Physician required for 2 evenings a week in Putney.—Address, No. 972, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Hand-picked Secretaries, S.R.N. and otherwise.—Wigmore AGENCY FOR MEDICAL SECRETARIES, 67, Wigmore-street, W.1 (HUNter 9951/2/3).

Devonshire-street address and part-time services of secretary offered. Suitable for anæsthetist, &c.—Address, No. 971, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

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Available now, combined lease on self-contained unfurnished flat with consulting-room. Reception service provided. Quiet well-run medical consultant house, Devonshire-place, W.1.—Address, No. 966, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

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Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE, LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

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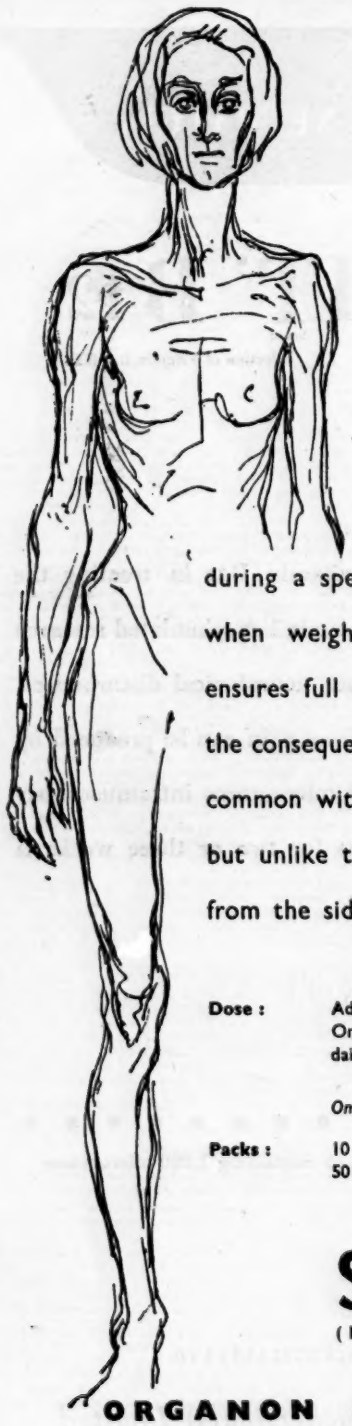

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